Sequence Listing

SEQUENCE LISTING

<110> Suzanne L. Bolten
      Alan M. Easton
      Leslie C. Engel
      Dean M. Messing
      John S. Ng
      Beverly A. Reitz
      Scott A. Vaccaro
      Mark C. Walker
      Ping T. Wang
      Robin A. Weinberg

<120> Aspergillus ochraceus 11 alpha
      hydroxylase and oxidoreductase

<130> S03196-00-US

<140> US 09/xxx,xxx
<141> 2001-10-26

<150> USSN 60/244,300
<151> 2000-10-30

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agccacaagc tgacagctca ttatc atg ccc ttc ttc act ggg ctt ctg gcg   172
                              Met Pro Phe Phe Thr Gly Leu Leu Ala
                                1   5

att tac cat agt ctc ata ctc gac aac cca gtc caa acc ctg agc acc   220
Ile Tyr His Ser Leu Ile Leu Asp Asn Pro Val Gln Thr Leu Ser Thr
   10   15   20   25

att gtc gta ttg gcg gca gcg tac tgg ctc gca acg ctc cag ccg agc   268
Ile Val Val Leu Ala Ala Ala Tyr Trp Leu Ala Thr Leu Gln Pro Ser
            30   35   40

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        gac ctt cct gag ctg aat ccc gcc aaa cca ttc gag ttc acc aat cgt      316
        Asp Leu Pro Glu Leu Asn Pro Ala Lys Pro Phe Glu Phe Thr Asn Arg
 5                   45                  50                  55

        cgt cgt gtt cat gag ttt gtt gaa aat agt aag agc ttg ctt gct cgg      364
        Arg Arg Val His Glu Phe Val Glu Asn Ser Lys Ser Leu Leu Ala Arg
                     60                  65                  70

10      ggg agg gaa ttg cac ggg cac gag ccg tac aga ctc atg tct gaa tgg      412
        Gly Arg Glu Leu His Gly His Glu Pro Tyr Arg Leu Met Ser Glu Trp
                 75                  80                  85

        gga tcc ttg att gtc ctg ccc cca gag tgc gcc gac gag ctg cgc aac      460
15      Gly Ser Leu Ile Val Leu Pro Pro Glu Cys Ala Asp Glu Leu Arg Asn
         90                  95                 100                 105

        gac cca aga atg gac ttt gag acg ccc acc acc gac gac tcc cac gga      508
        Asp Pro Arg Met Asp Phe Glu Thr Pro Thr Thr Asp Asp Ser His Gly
20                          110                 115                 120

        tat atc cct ggc ttc gac gct ctc aac gca gac ccg aac ctg act aaa      556
        Tyr Ile Pro Gly Phe Asp Ala Leu Asn Ala Asp Pro Asn Leu Thr Lys
                         125                 130                 135
25
        gtg gtc acc aag tac ctc aca aaa gca ttg aac aag ctt act gct ccg      604
        Val Val Thr Lys Tyr Leu Thr Lys Ala Leu Asn Lys Leu Thr Ala Pro
                     140                 145                 150

30      atc tcg cat gaa gcg tcc atc gcc atg aaa gcg gtg ctg ggt gac gat      652
        Ile Ser His Glu Ala Ser Ile Ala Met Lys Ala Val Leu Gly Asp Asp
             155                 160                 165

        cca gat tgg cgt gag atc tac cca gcc aga gac ttg ctc cag ctc gtc      700
35      Pro Asp Trp Arg Glu Ile Tyr Pro Ala Arg Asp Leu Leu Gln Leu Val
        170                 175                 180                 185

        gcc cgg atg tcg aca aga gtg ttc ctt ggc gag gaa atg tgc aat aac      748
        Ala Arg Met Ser Thr Arg Val Phe Leu Gly Glu Glu Met Cys Asn Asn
40                       190                 195                 200

        cag gat tgg atc caa acc tca tca caa tac gcg gcc ctt gcc ttc ggt      796
        Gln Asp Trp Ile Gln Thr Ser Ser Gln Tyr Ala Ala Leu Ala Phe Gly
                     205                 210                 215
45
        gtc ggt gac aag ctt aga ata tac ccg aga atg atc aga ccg ata gta      844
        Val Gly Asp Lys Leu Arg Ile Tyr Pro Arg Met Ile Arg Pro Ile Val
                 220                 225                 230

50      cat tgg ttc atg cca tcc tgt tgg gag ctg cgc cga tcg ctg cga cgc      892
        His Trp Phe Met Pro Ser Cys Trp Glu Leu Arg Arg Ser Leu Arg Arg
             235                 240                 245

        tgc cga cag att ctc acg ccg tac att cac aaa cgc aag tcc ctg aag      940
55      Cys Arg Gln Ile Leu Thr Pro Tyr Ile His Lys Arg Lys Ser Leu Lys
        250                 255                 260                 265
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      ggg acc acg gac gag cag ggc aag ccc ctt atg ttt gat gat tcc atc      988
      Gly Thr Thr Asp Glu Gln Gly Lys Pro Leu Met Phe Asp Asp Ser Ile
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5     gag tgg ttc gag cga gag ctg ggt ccc aac cac gac gcg gtc ctg aag      1036
      Glu Trp Phe Glu Arg Glu Leu Gly Pro Asn His Asp Ala Val Leu Lys
                      285             290             295

10    cag gtc acg ctc tcc ata gtt gct atc cac acc acg agt gac cta ctc      1084
      Gln Val Thr Leu Ser Ile Val Ala Ile His Thr Thr Ser Asp Leu Leu
                      300             305             310

      ttg cag gcc atg agc gat ctc gcg cag aac ccg aaa gtg cta caa gca      1132
      Leu Gln Ala Met Ser Asp Leu Ala Gln Asn Pro Lys Val Leu Gln Ala
15                    315             320             325

      gtg cgc gag gag gtg gtc cga gtg ctg agc acc gag ggg ctc agc aag      1180
      Val Arg Glu Glu Val Val Arg Val Leu Ser Thr Glu Gly Leu Ser Lys
      330                 335             340                 345

20
      gtc tcg ctt cac agt ctc aag ctc atg gac agc gcg ttg aag gaa agc      1228
      Val Ser Leu His Ser Leu Lys Leu Met Asp Ser Ala Leu Lys Glu Ser
                          350             355             360

25    cag cgt ctc agg cct acg ctt ctc ggc tcc ttt cgt cgg cag gca acg      1276
      Gln Arg Leu Arg Pro Thr Leu Leu Gly Ser Phe Arg Arg Gln Ala Thr
                      365             370             375

      aat gac atc aag ctg aag agc ggg ttt gtc ata aag aaa ggg act aga      1324
      Asn Asp Ile Lys Leu Lys Ser Gly Phe Val Ile Lys Lys Gly Thr Arg
30                    380             385             390

      gtc gtg atc gac agc acc cat atg tgg aat ccc gag tat tac act gac      1372
      Val Val Ile Asp Ser Thr His Met Trp Asn Pro Glu Tyr Tyr Thr Asp
35          395             400             405

      cct ctc cag tac gac ggg tac cgc tac ttc aac aag cgg cag aca ccc      1420
      Pro Leu Gln Tyr Asp Gly Tyr Arg Tyr Phe Asn Lys Arg Gln Thr Pro
      410                 415             420             425

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      ggc gag gac aag aac gcg ttg ctc gtc agc aca agc gcc aac cac atg      1468
      Gly Glu Asp Lys Asn Ala Leu Leu Val Ser Thr Ser Ala Asn His Met
                      430             435             440

45    gga ttc ggt cac ggc gtt cac gcc tgt cct ggc aga ttc ttc gcc tcc      1516
      Gly Phe Gly His Gly Val His Ala Cys Pro Gly Arg Phe Phe Ala Ser
                      445             450             455

      aac gag atc aag att gcc ttg tgt cat atc atc tta aat tat gag tgg      1564
50    Asn Glu Ile Lys Ile Ala Leu Cys His Ile Ile Leu Asn Tyr Glu Trp
                      460             465             470

      cgt ctt cca gac ggc ttc aag ccc cag cct ctc aac atc ggg atg act      1612
      Arg Leu Pro Asp Gly Phe Lys Pro Gln Pro Leu Asn Ile Gly Met Thr
55                    475             480             485

      tat ctg gcg gat ccc aat acc agg atg ctg atc agg cca cgc aag gcg      1660
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Tyr Leu Ala Asp Pro Asn Thr Arg Met Leu Ile Arg Pro Arg Lys Ala
490             495             500             505


gag atc gat atg gcg agt tta act gtg tag gtcgaacacg aagtcctgat      1710
Glu Ile Asp Met Ala Ser Leu Thr Val  *
            510


gaagtgttat tggtcagtgg gtgaagcaag tcgcagaaat gtgtaacaat ttataagaat    1770
aaaaaa                                                              1776
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            20                  25                  30
Tyr Trp Leu Ala Thr Leu Gln Pro Ser Asp Leu Pro Glu Leu Asn Pro
        35                  40                  45
Ala Lys Pro Phe Glu Phe Thr Asn Arg Arg Val His Glu Phe Val
        50                  55              60
Glu Asn Ser Lys Ser Leu Leu Ala Arg Gly Arg Glu Leu His Gly His
65                  70                  75                  80
Glu Pro Tyr Arg Leu Met Ser Glu Trp Gly Ser Leu Ile Val Leu Pro
                85                  90                  95
Pro Glu Cys Ala Asp Glu Leu Arg Asn Asp Pro Arg Met Asp Phe Glu
            100                 105                 110
Thr Pro Thr Thr Asp Asp Ser His Gly Tyr Ile Pro Gly Phe Asp Ala
            115                 120                 125
Leu Asn Ala Asp Pro Asn Leu Thr Lys Val Val Thr Lys Tyr Leu Thr
        130                 135                 140
Lys Ala Leu Asn Lys Leu Thr Ala Pro Ile Ser His Glu Ala Ser Ile
145                 150                 155                 160
Ala Met Lys Ala Val Leu Gly Asp Asp Pro Asp Trp Arg Glu Ile Tyr
                165                 170                 175
Pro Ala Arg Asp Leu Leu Gln Leu Val Ala Arg Met Ser Thr Arg Val
            180                 185                 190
Phe Leu Gly Glu Glu Met Cys Asn Asn Gln Asp Trp Ile Gln Thr Ser
        195                 200                 205
Ser Gln Tyr Ala Ala Leu Ala Phe Gly Val Gly Asp Lys Leu Arg Ile
        210                 215                 220
Tyr Pro Arg Met Ile Arg Pro Ile Val His Trp Phe Met Pro Ser Cys
225                 230                 235                 240
Trp Glu Leu Arg Arg Ser Leu Arg Arg Cys Arg Gln Ile Leu Thr Pro
                245                 250                 255
Tyr Ile His Lys Arg Lys Ser Leu Lys Gly Thr Thr Asp Glu Gln Gly
                260                 265                 270
Lys Pro Leu Met Phe Asp Asp Ser Ile Glu Trp Phe Glu Arg Glu Leu
            275                 280                 285
Gly Pro Asn His Asp Ala Val Leu Lys Gln Val Thr Leu Ser Ile Val
        290                 295                 300
Ala Ile His Thr Thr Ser Asp Leu Leu Leu Gln Ala Met Ser Asp Leu
305                 310                 315                 320
Ala Gln Asn Pro Lys Val Leu Gln Ala Val Arg Glu Glu Val Val Arg
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                   325                330                335
Val Leu Ser Thr Glu Gly Leu Ser Lys Val Ser Leu His Ser Leu Lys
               340                345                350
Leu Met Asp Ser Ala Leu Lys Glu Ser Gln Arg Leu Arg Pro Thr Leu
           355                360                365
Leu Gly Ser Phe Arg Arg Gln Ala Thr Asn Asp Ile Lys Leu Lys Ser
       370                375                380
Gly Phe Val Ile Lys Lys Gly Thr Arg Val Val Ile Asp Ser Thr His
   385                390                395                400
Met Trp Asn Pro Glu Tyr Tyr Thr Asp Pro Leu Gln Tyr Asp Gly Tyr
               405                410                415
Arg Tyr Phe Asn Lys Arg Gln Thr Pro Gly Glu Asp Lys Asn Ala Leu
           420                425                430
Leu Val Ser Thr Ser Ala Asn His Met Gly Phe Gly His Gly Val His
       435                440                445
Ala Cys Pro Gly Arg Phe Phe Ala Ser Asn Glu Ile Lys Ile Ala Leu
       450                455                460
Cys His Ile Ile Leu Asn Tyr Glu Trp Arg Leu Pro Asp Gly Phe Lys
   465                470                475                480
Pro Gln Pro Leu Asn Ile Gly Met Thr Tyr Leu Ala Asp Pro Asn Thr
               485                490                495
Arg Met Leu Ile Arg Pro Arg Lys Ala Glu Ile Asp Met Ala Ser Leu
           500                505                510
Thr Val
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1               5                  10                 15


gcc gaa gaa gta tct ctt ttc agc atg acg gac atg att ctg ttt tcg    96
Ala Glu Glu Val Ser Leu Phe Ser Met Thr Asp Met Ile Leu Phe Ser
            20                 25                 30


ctc atc gtg ggt ctc cta acc tac tgg ttc ctc ttc aga aag aaa aaa   144
Leu Ile Val Gly Leu Leu Thr Tyr Trp Phe Leu Phe Arg Lys Lys Lys
        35                 40                 45


gaa gaa gtc ccc gag ttc acc aaa att cag aca ttg acc tcc tct gtc   192
Glu Glu Val Pro Glu Phe Thr Lys Ile Gln Thr Leu Thr Ser Ser Val
        50                 55                 60


aga gag agc agc ttt gtg gaa aag atg aag aaa acg ggg agg aac atc   240
Arg Glu Ser Ser Phe Val Glu Lys Met Lys Lys Thr Gly Arg Asn Ile
65                 70                 75                 80
```

```
atc gtg ttc tac ggc tcc cag acg ggg act gca gag gag ttt gcc aac          288
Ile Val Phe Tyr Gly Ser Gln Thr Gly Thr Ala Glu Glu Phe Ala Asn
                    85                  90                  95

cgc ctg tcc aag gac gcc cac cgc tac ggg atg cga ggc atg tca gcg          336
Arg Leu Ser Lys Asp Ala His Arg Tyr Gly Met Arg Gly Met Ser Ala
                100                 105                 110

gac cct gag gag tat gac ctg gcc gac ctg agc agc ctg cca gag atc          384
Asp Pro Glu Glu Tyr Asp Leu Ala Asp Leu Ser Ser Leu Pro Glu Ile
            115                 120                 125

gac aac gcc ctg gtg gtt ttc tgc atg gcc acc tac ggt gag gga gac          432
Asp Asn Ala Leu Val Val Phe Cys Met Ala Thr Tyr Gly Glu Gly Asp
            130                 135                 140

ccc acc gac aat gcc cag gac ttc tac gac tgg ctg cag gag aca gac          480
Pro Thr Asp Asn Ala Gln Asp Phe Tyr Asp Trp Leu Gln Glu Thr Asp
145                 150                 155                 160

gtg gat ctc tct ggg gtc aag ttc gcg gtg ttt ggt ctt ggg aac aag          528
Val Asp Leu Ser Gly Val Lys Phe Ala Val Phe Gly Leu Gly Asn Lys
                165                 170                 175

acc tac gag cac ttc aat gcc atg ggc aag tac gtg gac aag cgg ctg          576
Thr Tyr Glu His Phe Asn Ala Met Gly Lys Tyr Val Asp Lys Arg Leu
                180                 185                 190

gag cag ctc ggc gcc cag cgc atc ttt gag ctg ggg ttg ggc gac gac          624
Glu Gln Leu Gly Ala Gln Arg Ile Phe Glu Leu Gly Leu Gly Asp Asp
            195                 200                 205

gat ggg aac ttg gag gag gac ttc atc acc tgg cga gag cag ttc tgg          672
Asp Gly Asn Leu Glu Glu Asp Phe Ile Thr Trp Arg Glu Gln Phe Trp
            210                 215                 220

ccg gcc gtg tgt gaa cac ttt ggg gtg gaa gcc act ggc gag gag tcc          720
Pro Ala Val Cys Glu His Phe Gly Val Glu Ala Thr Gly Glu Glu Ser
225                 230                 235                 240

agc att cgc cag tac gag ctt gtg gtc cac acc gac ata gat gcg gcc          768
Ser Ile Arg Gln Tyr Glu Leu Val Val His Thr Asp Ile Asp Ala Ala
                245                 250                 255

aag gtg tac atg ggg gag atg ggc cgg ctg aag agc tac gag aac cag          816
Lys Val Tyr Met Gly Glu Met Gly Arg Leu Lys Ser Tyr Glu Asn Gln
                260                 265                 270

aag ccc ccc ttt gat gcc aag aat ccg ttc ctg gct gca gtc acc acc          864
Lys Pro Pro Phe Asp Ala Lys Asn Pro Phe Leu Ala Ala Val Thr Thr
                275                 280                 285

aac cgg aag ctg aac cag gga acc gag cgc cac ctc atg cac ctg gaa          912
Asn Arg Lys Leu Asn Gln Gly Thr Glu Arg His Leu Met His Leu Glu
            290                 295                 300

ttg gac atc tcg gac tcc aaa atc agg tat gaa tct ggg gac cac gtg          960
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```
                Leu Asp Ile Ser Asp Ser Lys Ile Arg Tyr Glu Ser Gly Asp His Val
                305             310             315             320

                gct gtg tac cca gcc aac gac tct gct ctc gtc aac cag ctg ggc aaa    1008
     5          Ala Val Tyr Pro Ala Asn Asp Ser Ala Leu Val Asn Gln Leu Gly Lys
                            325             330             335

                atc ctg ggt gcc gac ctg gac gtc gtc atg tcc ctg aac aac ctg gat    1056
     10         Ile Leu Gly Ala Asp Leu Asp Val Val Met Ser Leu Asn Asn Leu Asp
                            340             345             350

                gag gag tcc aac aag aag cac cca ttc ccg tgc cct acg tcc tac cgc    1104
                Glu Glu Ser Asn Lys Lys His Pro Phe Pro Cys Pro Thr Ser Tyr Arg
     15                     355             360             365

                acg gcc ctc acc tac tac ctg gac atc acc aac ccg ccg cgt acc aac    1152
                Thr Ala Leu Thr Tyr Tyr Leu Asp Ile Thr Asn Pro Pro Arg Thr Asn
                            370             375             380

     20         gtg ctg tac gag ctg gcg cag tac gcc tcg gag ccc tcg gag cag gag    1200
                Val Leu Tyr Glu Leu Ala Gln Tyr Ala Ser Glu Pro Ser Glu Gln Glu
                385             390             395             400

                ctg ctg cgc aag atg gcc tcc tcc tcc ggc gag ggc aag gag ctg tac    1248
     25         Leu Leu Arg Lys Met Ala Ser Ser Ser Gly Glu Gly Lys Glu Leu Tyr
                            405             410             415

                ctg agc tgg gtg gtg gag gcc cgg agg cac atc ctg gcc atc ctg cag    1296
     30         Leu Ser Trp Val Val Glu Ala Arg Arg His Ile Leu Ala Ile Leu Gln
                            420             425             430

                gac tgc ccg tcc ctg cgg ccc ccc atc gac cac ctg tgt gag ctg ctg    1344
                Asp Cys Pro Ser Leu Arg Pro Pro Ile Asp His Leu Cys Glu Leu Leu
                            435             440             445

     35         ccg cgc ctg cag gcc cgc tac tac tcc atc gcc tca tcc tcc aag gtc    1392
                Pro Arg Leu Gln Ala Arg Tyr Tyr Ser Ile Ala Ser Ser Ser Lys Val
                            450             455             460

     40         cac ccc aac tct gtg cac atc tgt gcg gtg gtt gtg gag tac gag acc    1440
                His Pro Asn Ser Val His Ile Cys Ala Val Val Val Glu Tyr Glu Thr
                465             470             475             480

                aag gcc ggc cgc atc aac aag ggc gtg gcc acc aac tgg ctg cgg gcc    1488
     45         Lys Ala Gly Arg Ile Asn Lys Gly Val Ala Thr Asn Trp Leu Arg Ala
                            485             490             495

                aag gag cct gcc ggg gag aac ggc ggc cgt gcg ctg gtg ccc atg ttc    1536
                Lys Glu Pro Ala Gly Glu Asn Gly Gly Arg Ala Leu Val Pro Met Phe
     50                     500             505             510

                gtg cgc aag tcc cag ttc cgc ctg ccc ttc aag gcc acc acg cct gtc    1584
                Val Arg Lys Ser Gln Phe Arg Leu Pro Phe Lys Ala Thr Thr Pro Val
                            515             520             525

     55
                atc atg gtg ggc ccc ggc acc ggg gtg gca ccc ttc ata ggc ttc atc    1632
                Ile Met Val Gly Pro Gly Thr Gly Val Ala Pro Phe Ile Gly Phe Ile
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                  530                    535                   540

     cag gag cgg gcc tgg ctg cga cag cag ggc aag gag gtg ggg gag acg    1680
     Gln Glu Arg Ala Trp Leu Arg Gln Gln Gly Lys Glu Val Gly Glu Thr
5    545                 550                 555                 560


     ctg ctg tac tac ggc tgc cgc cgc tcg gat gag gac tac ctg tac cgg    1728
     Leu Leu Tyr Tyr Gly Cys Arg Arg Ser Asp Glu Asp Tyr Leu Tyr Arg
                         565                 570                 575
10

     gag gag ctg gcg cag ttc cac agg gac ggt gcg ctc acc cag ctc aac    1776
     Glu Glu Leu Ala Gln Phe His Arg Asp Gly Ala Leu Thr Gln Leu Asn
                     580                 585                 590

15   gtg gcc ttc tcc cgg gag cag tcc cac aag gtc tac gtc cag cac ctg    1824
     Val Ala Phe Ser Arg Glu Gln Ser His Lys Val Tyr Val Gln His Leu
                 595                 600                 605


     cta aag caa gac cga gag cac ctg tgg aag ttg atc gaa ggc ggt gcc    1872
20   Leu Lys Gln Asp Arg Glu His Leu Trp Lys Leu Ile Glu Gly Gly Ala
                 610                 615                 620


     cac atc tac gtc tgt ggg gat gca cgg aac atg gcc agg gat gtg cag    1920
     His Ile Tyr Val Cys Gly Asp Ala Arg Asn Met Ala Arg Asp Val Gln
25   625                 630                 635                 640


     aac acc ttc tac gac atc gtg gct gag ctc ggg gcc atg gag cac gcg    1968
     Asn Thr Phe Tyr Asp Ile Val Ala Glu Leu Gly Ala Met Glu His Ala
                         645                 650                 655
30

     cag gcg gtg gac tac atc aag aaa ctg atg acc aag ggc cgc tac tcc    2016
     Gln Ala Val Asp Tyr Ile Lys Lys Leu Met Thr Lys Gly Arg Tyr Ser
                 660                 665                 670


35   ctg gac gtg tgg agc                                                2031
     Leu Asp Val Trp Ser
                 675



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                     20                  25                  30
50   Leu Ile Val Gly Leu Leu Thr Tyr Trp Phe Leu Phe Arg Lys Lys Lys
                 35                  40                  45
     Glu Glu Val Pro Glu Phe Thr Lys Ile Gln Thr Leu Thr Ser Ser Val
             50                  55                  60
     Arg Glu Ser Ser Phe Val Glu Lys Met Lys Lys Thr Gly Arg Asn Ile
55   65                  70                  75                  80
     Ile Val Phe Tyr Gly Ser Gln Thr Gly Thr Ala Glu Glu Phe Ala Asn
                     85                  90                  95
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Arg Leu Ser Lys Asp Ala His Arg Tyr Gly Met Arg Gly Met Ser Ala
            100   105   110

Asp Pro Glu Glu Tyr Asp Leu Ala Asp Leu Ser Ser Leu Pro Glu Ile
            115   120   125

Asp Asn Ala Leu Val Val Phe Cys Met Ala Thr Tyr Gly Glu Gly Asp
            130   135   140

Pro Thr Asp Asn Ala Gln Asp Phe Tyr Asp Trp Leu Gln Glu Thr Asp
145   150   155   160

Val Asp Leu Ser Gly Val Lys Phe Ala Val Phe Gly Leu Gly Asn Lys
                165   170   175

Thr Tyr Glu His Phe Asn Ala Met Gly Lys Tyr Val Asp Lys Arg Leu
            180   185   190

Glu Gln Leu Gly Ala Gln Arg Ile Phe Glu Leu Gly Leu Gly Asp Asp
            195   200   205

Asp Gly Asn Leu Glu Glu Asp Phe Ile Thr Trp Arg Glu Gln Phe Trp
            210   215   220

Pro Ala Val Cys Glu His Phe Gly Val Glu Ala Thr Gly Glu Glu Ser
225   230   235   240

Ser Ile Arg Gln Tyr Glu Leu Val Val His Thr Asp Ile Asp Ala Ala
                245   250   255

Lys Val Tyr Met Gly Glu Met Gly Arg Leu Lys Ser Tyr Glu Asn Gln
            260   265   270

Lys Pro Pro Phe Asp Ala Lys Asn Pro Phe Leu Ala Ala Val Thr Thr
            275   280   285

Asn Arg Lys Leu Asn Gln Gly Thr Glu Arg His Leu Met His Leu Glu
            290   295   300

Leu Asp Ile Ser Asp Ser Lys Ile Arg Tyr Glu Ser Gly Asp His Val
305   310   315   320

Ala Val Tyr Pro Ala Asn Asp Ser Ala Leu Val Asn Gln Leu Gly Lys
                325   330   335

Ile Leu Gly Ala Asp Leu Asp Val Val Met Ser Leu Asn Asn Leu Asp
            340   345   350

Glu Glu Ser Asn Lys Lys His Pro Phe Pro Cys Pro Thr Ser Tyr Arg
            355   360   365

Thr Ala Leu Thr Tyr Tyr Leu Asp Ile Thr Asn Pro Pro Arg Thr Asn
            370   375   380

Val Leu Tyr Glu Leu Ala Gln Tyr Ala Ser Glu Pro Ser Glu Gln Glu
385   390   395   400

Leu Leu Arg Lys Met Ala Ser Ser Ser Gly Glu Gly Lys Glu Leu Tyr
                405   410   415

Leu Ser Trp Val Val Glu Ala Arg Arg His Ile Leu Ala Ile Leu Gln
            420   425   430

Asp Cys Pro Ser Leu Arg Pro Pro Ile Asp His Leu Cys Glu Leu Leu
            435   440   445

Pro Arg Leu Gln Ala Arg Tyr Tyr Ser Ile Ala Ser Ser Ser Lys Val
            450   455   460

His Pro Asn Ser Val His Ile Cys Ala Val Val Val Glu Tyr Glu Thr
465   470   475   480

Lys Ala Gly Arg Ile Asn Lys Gly Val Ala Thr Asn Trp Leu Arg Ala
                485   490   495

Lys Glu Pro Ala Gly Glu Asn Gly Gly Arg Ala Leu Val Pro Met Phe
            500   505   510

Val Arg Lys Ser Gln Phe Arg Leu Pro Phe Lys Ala Thr Thr Pro Val
            515   520   525

Ile Met Val Gly Pro Gly Thr Gly Val Ala Pro Phe Ile Gly Phe Ile
            530   535   540

Gln Glu Arg Ala Trp Leu Arg Gln Gln Gly Lys Glu Val Gly Glu Thr

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545                 550                 555                 560
Leu Leu Tyr Tyr Gly Cys Arg Arg Ser Asp Glu Asp Tyr Leu Tyr Arg
                    565                 570                 575
Glu Glu Leu Ala Gln Phe His Arg Asp Gly Ala Leu Thr Gln Leu Asn
                580                 585                 590
Val Ala Phe Ser Arg Glu Gln Ser His Lys Val Tyr Val Gln His Leu
            595                 600                 605
Leu Lys Gln Asp Arg Glu His Leu Trp Lys Leu Ile Glu Gly Gly Ala
        610                 615                 620
His Ile Tyr Val Cys Gly Asp Ala Arg Asn Met Ala Arg Asp Val Gln
625                 630                 635                 640
Asn Thr Phe Tyr Asp Ile Val Ala Glu Leu Gly Ala Met Glu His Ala
                645                 650                 655
Gln Ala Val Asp Tyr Ile Lys Lys Leu Met Thr Lys Gly Arg Tyr Ser
                660                 665                 670
Leu Asp Val Trp Ser
            675
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ctctccccct cccgccccga ccctccttat cttctcctcc cgtccagcat ttagctcgcc    180
atcgaattcg caattccttc ctcgtgactc ttcatcgctg agcgtcctca tc atg gcg    238
                                                          Met Ala
                                                            1

caa ctc gat act ctc gat ttg gtc gtc ctg gtg gcg ctc ttg gtg ggt    286
Gln Leu Asp Thr Leu Asp Leu Val Val Leu Val Ala Leu Leu Val Gly
        5                   10                  15

agc gtg gcc tac ttc acc aag ggc acc tac tgg gcc gtc gcc aaa gac    334
Ser Val Ala Tyr Phe Thr Lys Gly Thr Tyr Trp Ala Val Ala Lys Asp
        20                  25                  30

cct tat gcc tcg gct ggt ccg gcg atg aat gga ggc gcc aag gcc ggc    382
Pro Tyr Ala Ser Ala Gly Pro Ala Met Asn Gly Gly Ala Lys Ala Gly
    35                  40                  45                  50

aag act cgc gac att gtt cag aaa atg gac gaa act ggc aaa aac tgt    430
Lys Thr Arg Asp Ile Val Gln Lys Met Asp Glu Thr Gly Lys Asn Cys
                55                  60                  65

gtg att ttc tac ggc tcg caa acc ggt acc gct gag gac tac gcg tcc    478
Val Ile Phe Tyr Gly Ser Gln Thr Gly Thr Ala Glu Asp Tyr Ala Ser
                70                  75                  80

aga ctg gcc aag gaa ggc tcc cag cga ttc ggt ctc aag acc atg gtg    526
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                  Arg Leu Ala Lys Glu Gly Ser Gln Arg Phe Gly Leu Lys Thr Met Val
                           85                  90                  95


              5   gcc gat ctg gag gac tac gac tac gaa aac ctg gaa aag ttc ccc gag    574
                  Ala Asp Leu Glu Asp Tyr Asp Tyr Glu Asn Leu Glu Lys Phe Pro Glu
                           100                 105                 110


             10   gac aag gtt gtt ttc ttc gtt ctg gcc act tat ggc gag ggt gaa ccc    622
                  Asp Lys Val Val Phe Phe Val Leu Ala Thr Tyr Gly Glu Gly Glu Pro
                  115                 120                 125                 130


                  acg gat aat gcg gtt gaa ttc tac cag ttc gtc acg ggc gaa gat gct    670
                  Thr Asp Asn Ala Val Glu Phe Tyr Gln Phe Val Thr Gly Glu Asp Ala
             15            135                 140                 145


             20   gct ttc gag agc ggc gct acc gcc gac gat aag cct ctg tct tct ctc    718
                  Ala Phe Glu Ser Gly Ala Thr Ala Asp Asp Lys Pro Leu Ser Ser Leu
                           150                 155                 160


             20   aag tat gtc acg ttt ggt ctg ggt aac aac acc tat gag cac tac aac    766
                  Lys Tyr Val Thr Phe Gly Leu Gly Asn Asn Thr Tyr Glu His Tyr Asn
                           165                 170                 175


             25   gct atg gtt cgc aat gtg gac gcc gct ctc aca aag ttc ggc gcc caa    814
                  Ala Met Val Arg Asn Val Asp Ala Ala Leu Thr Lys Phe Gly Ala Gln
                           180                 185                 190


             30   cgc att ggc tct gct ggt gag ggt gac gac ggc gct ggt aca atg gaa    862
                  Arg Ile Gly Ser Ala Gly Glu Gly Asp Asp Gly Ala Gly Thr Met Glu
                  195                 200                 205                 210


                  gag gat ttc ctg gcc tgg aag gaa ccc atg tgg gct gcc ctt tct gag    910
                  Glu Asp Phe Leu Ala Trp Lys Glu Pro Met Trp Ala Ala Leu Ser Glu
             35            215                 220                 225


                  gcg atg aac ctg caa gag cgc gat gcg gtc tac gag ccg gtc ttc aat    958
                  Ala Met Asn Leu Gln Glu Arg Asp Ala Val Tyr Glu Pro Val Phe Asn
                           230                 235                 240


             40   gtc acc gag gac gag tcc ctg agc ccc gaa gat gag aac gtt tac ctc   1006
                  Val Thr Glu Asp Glu Ser Leu Ser Pro Glu Asp Glu Asn Val Tyr Leu
                           245                 250                 255


             45   ggt gag ccc act caa ggt cat ctc caa ggc gag ccc aag ggc ccg tac   1054
                  Gly Glu Pro Thr Gln Gly His Leu Gln Gly Glu Pro Lys Gly Pro Tyr
                           260                 265                 270


                  tct gcg cac aac ccg ttc atc gct ccc atc tcc gaa tct cgt gaa ctg   1102
                  Ser Ala His Asn Pro Phe Ile Ala Pro Ile Ser Glu Ser Arg Glu Leu
             50   275                 280                 285                 290


                  ttc aac gtc aag gac cgc aac tgt ctg cac atg gaa atc agc atc gcc   1150
                  Phe Asn Val Lys Asp Arg Asn Cys Leu His Met Glu Ile Ser Ile Ala
                           295                 300                 305


             55   ggt agc aac ctc act tac cag act ggt gac cac atc gct gtt tgg ccc   1198
                  Gly Ser Asn Leu Thr Tyr Gln Thr Gly Asp His Ile Ala Val Trp Pro
```

                    310   315   320

acc aac gcc ggt tcc gag gtc gat cgg ttc ctg cag gct ttt ggt ctc   1246
Thr Asn Ala Gly Ser Glu Val Asp Arg Phe Leu Gln Ala Phe Gly Leu
        325   330   335

gaa gga aag cgc cac tcc gtc atc aac att aag ggt atc gat gtg acc   1294
Glu Gly Lys Arg His Ser Val Ile Asn Ile Lys Gly Ile Asp Val Thr
        340   345   350

gct aag gtt ccg att ccc act cct acg acc tat gac gcc gca gtt cgc   1342
Ala Lys Val Pro Ile Pro Thr Pro Thr Thr Tyr Asp Ala Ala Val Arg
355   360   365   370

tac tac ctg gaa gtc tgt gcc ccc gtt tcc cgt cag ttt gtc tcg act   1390
Tyr Tyr Leu Glu Val Cys Ala Pro Val Ser Arg Gln Phe Val Ser Thr
                    375   380   385

ctc gct gcc ttt gcc cct gat gaa gcg acc aag gcg gag atc gtt cgt   1438
Leu Ala Ala Phe Ala Pro Asp Glu Ala Thr Lys Ala Glu Ile Val Arg
                    390   395   400

ttg ggt ggc gac aag gac tat ttc cat gag aag att acc aac cga tgc   1486
Leu Gly Gly Asp Lys Asp Tyr Phe His Glu Lys Ile Thr Asn Arg Cys
        405   410   415

ttc aac atc gct cag gct ctc cag agc atc acg tcc aag cct ttc acc   1534
Phe Asn Ile Ala Gln Ala Leu Gln Ser Ile Thr Ser Lys Pro Phe Thr
        420   425   430

gcc gtc ccg ttc tcc ctg ctt atc gaa ggt atc acc aag ctt cag ccc   1582
Ala Val Pro Phe Ser Leu Leu Ile Glu Gly Ile Thr Lys Leu Gln Pro
435   440   445   450

cgt tac tac tcg atc tcc tcg tct tcc ctg gtt cag aag gac aag att   1630
Arg Tyr Tyr Ser Ile Ser Ser Ser Ser Leu Val Gln Lys Asp Lys Ile
                    455   460   465

agc att acc gcc gtt gtg gag tcg gtt cgc ttg cct ggt gag gaa cac   1678
Ser Ile Thr Ala Val Val Glu Ser Val Arg Leu Pro Gly Glu Glu His
                    470   475   480

att gtc aag ggt gtg acc acg aac tat ctt ctc gcg ctc aag gaa aag   1726
Ile Val Lys Gly Val Thr Thr Asn Tyr Leu Leu Ala Leu Lys Glu Lys
        485   490   495

caa aac ggc gag cct tcc cct gac ccg cac ggc ttg act tac tct atc   1774
Gln Asn Gly Glu Pro Ser Pro Asp Pro His Gly Leu Thr Tyr Ser Ile
        500   505   510

act gga ccc cgt aac aag tac gat ggc atc cat gtc ccc gtt cac gtc   1822
Thr Gly Pro Arg Asn Lys Tyr Asp Gly Ile His Val Pro Val His Val
515   520   525   530

cgc cac tcg aac ttc aaa ttg ccc tcg gat ccc tcg cga cct gtg atc   1870
Arg His Ser Asn Phe Lys Leu Pro Ser Asp Pro Ser Arg Pro Val Ile
                    535   540   545

```
atg gtt gga ccc ggt act ggt gtt gct cct ttc cgt ggg ttt atc cag      1918
Met Val Gly Pro Gly Thr Gly Val Ala Pro Phe Arg Gly Phe Ile Gln
             550             555             560

gag cgt gct gcc ttg gcc gcg aag ggc gag aag gtc gga act acc ttg      1966
Glu Arg Ala Ala Leu Ala Ala Lys Gly Glu Lys Val Gly Thr Thr Leu
         565             570             575

ctt ttc ttc ggc tgc cgt aag tcc gac gaa gat ttc ttg tac aag gat      2014
Leu Phe Phe Gly Cys Arg Lys Ser Asp Glu Asp Phe Leu Tyr Lys Asp
         580             585             590

gaa tgg aag act ttt cag gag cag ctt ggc gac tcg ctc aag atc atc      2062
Glu Trp Lys Thr Phe Gln Glu Gln Leu Gly Asp Ser Leu Lys Ile Ile
595             600             605             610

act gcc ttc tct cgt gaa tcg gct gag aaa gtc tac gtc cag cac agg      2110
Thr Ala Phe Ser Arg Glu Ser Ala Glu Lys Val Tyr Val Gln His Arg
                 615             620             625

ctg cgt gag cat gcc gag ctg gtc agt gac ctg ctg aag cag aaa gcc      2158
Leu Arg Glu His Ala Glu Leu Val Ser Asp Leu Leu Lys Gln Lys Ala
             630             635             640

act ttc tat gtt tgc ggt gac gct gcc aac atg gcc cgt gaa gtc aac      2206
Thr Phe Tyr Val Cys Gly Asp Ala Ala Asn Met Ala Arg Glu Val Asn
         645             650             655

ctc gtg ctt ggg caa atc att gcc aag cag cgc ggt ctc cct gcc gag      2254
Leu Val Leu Gly Gln Ile Ile Ala Lys Gln Arg Gly Leu Pro Ala Glu
         660             665             670

aag ggc gag gag atg gtg aag cac atg cgc agc agc ggc agc tac cag      2302
Lys Gly Glu Glu Met Val Lys His Met Arg Ser Ser Gly Ser Tyr Gln
675             680             685             690

gac gat gtc tgg tcc taa aa                                           2322
Asp Asp Val Trp Ser  *
             695
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<210> 6
<211> 695
<212> PRT
<213> Aspergillus ochraceus

<400> 6
Met Ala Gln Leu Asp Thr Leu Asp Leu Val Val Leu Val Ala Leu Leu
1               5               10              15
Val Gly Ser Val Ala Tyr Phe Thr Lys Gly Thr Tyr Trp Ala Val Ala
            20              25              30
Lys Asp Pro Tyr Ala Ser Ala Gly Pro Ala Met Asn Gly Gly Ala Lys
        35              40              45
Ala Gly Lys Thr Arg Asp Ile Val Gln Lys Met Asp Glu Thr Gly Lys
    50              55              60
Asn Cys Val Ile Phe Tyr Gly Ser Gln Thr Gly Thr Ala Glu Asp Tyr
```

```
         65                    70                    75                    80
        Ala Ser Arg Leu Ala Lys Glu Gly Ser Gln Arg Phe Gly Leu Lys Thr
                        85                    90                    95
        Met Val Ala Asp Leu Glu Asp Tyr Asp Tyr Glu Asn Leu Glu Lys Phe
                        100                   105                   110
        Pro Glu Asp Lys Val Val Phe Phe Val Leu Ala Thr Tyr Gly Glu Gly
                        115                   120                   125
        Glu Pro Thr Asp Asn Ala Val Glu Phe Tyr Gln Phe Val Thr Gly Glu
                        130                   135                   140
        Asp Ala Ala Phe Glu Ser Gly Ala Thr Ala Asp Asp Lys Pro Leu Ser
        145                   150                   155                   160
        Ser Leu Lys Tyr Val Thr Phe Gly Leu Gly Asn Asn Thr Tyr Glu His
                        165                   170                   175
        Tyr Asn Ala Met Val Arg Asn Val Asp Ala Ala Leu Thr Lys Phe Gly
                        180                   185                   190
        Ala Gln Arg Ile Gly Ser Ala Gly Glu Gly Asp Asp Gly Ala Gly Thr
                        195                   200                   205
        Met Glu Glu Asp Phe Leu Ala Trp Lys Glu Pro Met Trp Ala Ala Leu
                        210                   215                   220
        Ser Glu Ala Met Asn Leu Gln Glu Arg Asp Ala Val Tyr Glu Pro Val
        225                   230                   235                   240
        Phe Asn Val Thr Glu Asp Glu Ser Leu Ser Pro Glu Asp Glu Asn Val
                        245                   250                   255
        Tyr Leu Gly Glu Pro Thr Gln Gly His Leu Gln Gly Glu Pro Lys Gly
                        260                   265                   270
        Pro Tyr Ser Ala His Asn Pro Phe Ile Ala Pro Ile Ser Glu Ser Arg
                        275                   280                   285
        Glu Leu Phe Asn Val Lys Asp Arg Asn Cys Leu His Met Glu Ile Ser
                        290                   295                   300
        Ile Ala Gly Ser Asn Leu Thr Tyr Gln Thr Gly Asp His Ile Ala Val
        305                   310                   315                   320
        Trp Pro Thr Asn Ala Gly Ser Glu Val Asp Arg Phe Leu Gln Ala Phe
                        325                   330                   335
        Gly Leu Glu Gly Lys Arg His Ser Val Ile Asn Ile Lys Gly Ile Asp
                        340                   345                   350
        Val Thr Ala Lys Val Pro Ile Pro Thr Pro Thr Thr Tyr Asp Ala Ala
                        355                   360                   365
        Val Arg Tyr Tyr Leu Glu Val Cys Ala Pro Val Ser Arg Gln Phe Val
                        370                   375                   380
        Ser Thr Leu Ala Ala Phe Ala Pro Asp Glu Ala Thr Lys Ala Glu Ile
        385                   390                   395                   400
        Val Arg Leu Gly Gly Asp Lys Asp Tyr Phe His Glu Lys Ile Thr Asn
                        405                   410                   415
        Arg Cys Phe Asn Ile Ala Gln Ala Leu Gln Ser Ile Thr Ser Lys Pro
                        420                   425                   430
        Phe Thr Ala Val Pro Phe Ser Leu Leu Ile Glu Gly Ile Thr Lys Leu
                        435                   440                   445
        Gln Pro Arg Tyr Tyr Ser Ile Ser Ser Ser Leu Val Gln Lys Asp
                        450                   455                   460
        Lys Ile Ser Ile Thr Ala Val Val Glu Ser Val Arg Leu Pro Gly Glu
        465                   470                   475                   480
        Glu His Ile Val Lys Gly Val Thr Thr Asn Tyr Leu Leu Ala Leu Lys
                        485                   490                   495
        Glu Lys Gln Asn Gly Glu Pro Ser Pro Asp Pro His Gly Leu Thr Tyr
                        500                   505                   510
        Ser Ile Thr Gly Pro Arg Asn Lys Tyr Asp Gly Ile His Val Pro Val
                        515                   520                   525
```

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His Val Arg His Ser Asn Phe Lys Leu Pro Ser Asp Pro Ser Arg Pro
    530                 535             540
Val Ile Met Val Gly Pro Gly Thr Gly Val Ala Pro Phe Arg Gly Phe
545                 550                 555                 560
Ile Gln Glu Arg Ala Ala Leu Ala Ala Lys Gly Glu Lys Val Gly Thr
                565                 570                 575
Thr Leu Leu Phe Phe Gly Cys Arg Lys Ser Asp Glu Asp Phe Leu Tyr
                580                 585                 590
Lys Asp Glu Trp Lys Thr Phe Gln Glu Gln Leu Gly Asp Ser Leu Lys
                595                 600                 605
Ile Ile Thr Ala Phe Ser Arg Glu Ser Ala Glu Lys Val Tyr Val Gln
            610                 615                 620
His Arg Leu Arg Glu His Ala Glu Leu Val Ser Asp Leu Leu Lys Gln
625                 630                 635                 640
Lys Ala Thr Phe Tyr Val Cys Gly Asp Ala Ala Asn Met Ala Arg Glu
                645                 650                 655
Val Asn Leu Val Leu Gly Gln Ile Ile Ala Lys Gln Arg Gly Leu Pro
                660                 665                 670
Ala Glu Lys Gly Glu Glu Met Val Lys His Met Arg Ser Ser Gly Ser
                675                 680                 685
Tyr Gln Asp Asp Val Trp Ser
    690                 695


<210> 7
<211> 36
<212> DNA
<213> human primer H. oxred 1A


<400> 7
gatcggatcc aatatgggag actcccacgt ggacac                          36


<210> 8
<211> 36
<212> DNA
<213> human primer H. oxred 1B


<400> 8
gatcggatcc aatatgggag actcccacgt ggacac                          36


<210> 9
<211> 22
<212> DNA
<213> human primer H. oxred 2A


<400> 9
ctctgctctc gtcaaccagc tg                                        22


<210> 10
<211> 35
<212> DNA
<213> human primer H. oxred 2B


<400> 10
gatcggtacc ttagctccac acgtccaggg agtag                          35


<210> 11
<211> 20
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<212> DNA
<213> Aspergillus primer A. oxred-for1


<220>
<221> modified_base
<222> (6)...(6)
<223> I - Inosine


<221> modified_base
<222> (9)...(9)
<223> I - Inosine


<221> misc_feature
<222> (1)...(20)
<223> n = Inosine


<400> 11
gacggngcng gtacaatgga                                              20


<210> 12
<211> 26
<212> DNA
<213> Aspergillus Primer A.oxred-rev1


<220>
<221> modified_base
<222> (4)...(4)
<223> I - Inosine


<221> modified_base
<222> (10)...(10)
<223> I - Inosine


<221> modified_base
<222> (16)...(16)
<223> I - Inosine


<221> misc_feature
<222> (1)...(26)
<223> n = Inosine


<400> 12
ttangaccan acatcntcct ggtagc                                       26


<210> 13
<211> 28
<212> DNA
<213> E. coli Primer pSport-for1


<400> 13
caagctctaa tacgactcac tataggga                                     28


<210> 14
<211> 22
<212> DNA
<213> Aspergillus Primer A.oxred-rev2
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<400> 14
caggaaccga tcgacctcgg aa   22

<210> 15
<211> 25
<212> DNA
<213> Aspergillus Primer A.oxred-rev3

<400> 15
gtcaccctca ccagcagagc caatg   25

<210> 16
<211> 28
<212> DNA
<213> Aspergillus Primer A.oxred-rev4

<400> 16
ccacattgcg aaccatagcg ttgtagtg   28

<210> 17
<211> 34
<212> DNA
<213> E. coli Primer pSport-for2

<400> 17
gccaagctct aatacgactc actataggga aagc   34

<210> 18
<211> 27
<212> DNA
<213> Aspergillus Primer A.oxred-for2

<400> 18
gtcgacatgg cgcaactcga tactctc   27

<210> 19
<211> 31
<212> DNA
<213> Aspergillus Primer A.oxred-rev5

<400> 19
ctcgagttag gaccagacat cgtcctggta g   31

<210> 20
<211> 24
<212> DNA
<213> Aspergillus Primer A.oxred-for3

<400> 20
ggatccctcg cgacctgtga tcat   24

<210> 21
<211> 38
<212> DNA
<213> Aspergillus Primer A.oxred-for4

<400> 21

cgaagatttc ttgtacaagg atgaatggaa gacttttc   38

<210> 22
<211> 36
<212> DNA
<213> Aspergillus Primer A.oxred-rev6

<400> 22
ctgaaaagtc ttccattcat ccttgtacaa gaaatc   36

<210> 23
<211> 18
<212> PRT
<213> Aspergillus 11aOH peptide 1

<400> 23
Ala Ala Ala Tyr Trp Leu Ala Thr Leu Gln Pro Ser Asp Leu Pro Glu
1   5   10   15
Leu Asn

<210> 24
<211> 20
<212> PRT
<213> Aspergillus 11aOH peptide 2:

<400> 24
Cys Arg Gln Ile Leu Thr Pro Tyr Ile His Lys Arg Lys Ser Leu Lys
1   5   10   15
Gly Thr Thr Asp
            20

<210> 25
<211> 21
<212> PRT
<213> Aspergillus 11aOH peptide 3

<400> 25
His Met Gly Phe Gly His Gly Val His Ala Cys Pro Gly Arg Phe Phe
1   5   10   15
Ala Ser Asn Glu Ile
            20

<210> 26
<211> 20
<212> PRT
<213> Human oxr peptide 1

<400> 26
Cys Thr Tyr Trp Ala Val Ala Lys Asp Pro Tyr Ala Ser Ala Gly Pro
1   5   10   15
Ala Met Asn Gly
            20

<210> 27
<211> 526
<212> PRT

<213> Gibberella fujikuroi CAA75565

<400> 27

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Met Ala Asn His Ser Ser Ser Tyr Tyr His Glu Phe Tyr Lys Asp His
1               5                   10                  15
Ser His Thr Val Leu Thr Leu Met Ser Glu Lys Pro Val Ile Leu Pro
            20                  25                  30
Ser Leu Ile Leu Gly Thr Cys Ala Val Leu Leu Cys Ile Gln Trp Leu
            35                  40                  45
Lys Pro Gln Pro Leu Ile Met Val Asn Gly Arg Lys Phe Gly Glu Leu
        50                  55                  60
Ser Asn Val Arg Ala Lys Arg Asp Phe Thr Phe Gly Ala Arg Gln Leu
65                  70                  75                  80
Leu Glu Lys Gly Leu Lys Met Ser Pro Asp Lys Pro Phe Arg Ile Met
                85                  90                  95
Gly Asp Val Gly Glu Leu His Ile Leu Pro Pro Lys Tyr Ala Tyr Glu
            100                 105                 110
Val Arg Asn Asn Glu Lys Leu Ser Phe Thr Met Ala Ala Phe Lys Trp
            115                 120                 125
Phe Tyr Ala His Leu Pro Gly Phe Glu Gly Phe Arg Glu Gly Thr Asn
        130                 135                 140
Glu Ser His Ile Met Lys Leu Val Ala Arg His Gln Leu Thr His Gln
145                 150                 155                 160
Leu Thr Leu Val Thr Gly Ala Val Ser Glu Glu Cys Ala Leu Val Leu
                165                 170                 175
Lys Asp Val Tyr Thr Asp Ser Pro Glu Trp His Asp Ile Thr Ala Lys
            180                 185                 190
Asp Ala Asn Met Lys Leu Met Ala Arg Ile Thr Ser Arg Val Phe Leu
            195                 200                 205
Gly Lys Glu Met Cys Arg Asn Pro Gln Trp Leu Arg Ile Thr Ser Thr
            210                 215                 220
Tyr Ala Val Ile Ala Phe Arg Ala Val Glu Glu Leu Arg Leu Trp Pro
225                 230                 235                 240
Ser Trp Leu Arg Pro Val Val Gln Trp Phe Met Pro His Cys Thr Gln
                245                 250                 255
Ser Arg Ala Leu Val Gln Glu Ala Arg Asp Leu Ile Asn Pro Leu Leu
            260                 265                 270
Glu Arg Arg Arg Glu Glu Lys Ala Glu Ala Glu Arg Thr Gly Glu Lys
            275                 280                 285
Val Thr Tyr Asn Asp Ala Val Glu Trp Leu Asp Asp Leu Ala Arg Glu
        290                 295                 300
Lys Gly Val Gly Tyr Asp Pro Ala Cys Ala Gln Leu Ser Leu Ser Val
305                 310                 315                 320
Ala Ala Leu His Ser Thr Thr Asp Phe Phe Thr Gln Val Met Phe Asp
                325                 330                 335
Ile Ala Gln Asn Pro Glu Leu Ile Glu Pro Leu Arg Glu Glu Ile Ile
            340                 345                 350
Ala Val Leu Gly Lys Gln Gly Trp Ser Lys Asn Ser Leu Tyr Asn Leu
            355                 360                 365
Lys Leu Met Asp Ser Val Leu Lys Glu Ser Gln Arg Leu Lys Pro Ile
        370                 375                 380
Ala Ile Ala Ser Met Arg Arg Phe Thr Thr His Asn Val Lys Leu Ser
385                 390                 395                 400
Asp Gly Val Ile Leu Pro Lys Asn Lys Leu Thr Leu Val Ser Ala His
            405                 410                 415
Gln His Trp Asp Pro Glu Tyr Tyr Lys Asp Pro Leu Lys Phe Asp Gly
            420                 425                 430
```

```
Tyr Arg Phe Phe Asn Met Arg Arg Glu Pro Gly Lys Glu Ser Lys Ala
        435             440             445
Gln Leu Val Ser Ala Thr Pro Asp His Met Gly Phe Gly Tyr Gly Leu
    450             455             460
His Ala Cys Pro Gly Arg Phe Phe Ala Ser Glu Glu Ile Lys Ile Ala
465             470             475             480
Leu Ser His Ile Leu Leu Lys Tyr Asp Phe Lys Pro Val Glu Gly Ser
            485             490             495
Ser Met Glu Pro Arg Lys Tyr Gly Leu Asn Met Asn Ala Asn Pro Thr
            500             505             510
Ala Lys Leu Ser Val Arg Arg Arg Lys Glu Glu Ile Ala Ile
        515             520             525
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<210> 28
<211> 514
<212> PRT
<213> Neurospora crassa CAB91316

<400> 28

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Met Glu Arg Leu Asp Ile Lys Ser Ile Thr Asp Pro Ser Ala Thr Pro
1               5               10              15
Phe Ser Tyr Leu Val Thr Ala Phe Leu Leu Ala Val Val Val Tyr Ser
        20              25              30
Leu Gln Gly Pro Arg Phe Pro Lys Asn Ile Lys His Leu Asn Pro Lys
        35              40              45
Gly Pro Leu Glu Phe Ser Asp Thr Arg Pro Lys Lys Glu Phe Val Tyr
    50              55              60
Gly Ser Arg Gln Met Leu Ala Asn Trp Phe Lys Ala Asn Pro Asn Lys
65              70              75              80
Pro Cys Arg Val Ile Ser Asp Phe Gly Glu Ala Ile Val Leu Pro Pro
            85              90              95
Arg Met Ala Asn Glu Ile Lys Asn Asp Asp Arg Leu Ser Phe Thr Arg
        100             105             110
Trp Thr Tyr Lys Ala Phe His Gly His Leu Pro Gly Phe Glu Gly Phe
        115             120             125
Gly Glu Ala Ser Arg Glu Ser His Ile Val Gln Glu Val Ile Met Arg
    130             135             140
Asp Leu Thr Lys Tyr Leu Asn Lys Val Thr Glu Pro Leu Ala Gln Glu
145             150             155             160
Thr Ser Met Ala Met Glu Ala Asn Leu Pro Lys Ala Ala Asn Gly Glu
            165             170             175
Trp Ser Thr Ile Asn Leu Arg Ser Lys Ile Leu Pro Ile Val Ala Arg
            180             185             190
Ile Ser Ser Arg Val Phe Leu Gly Glu Glu Leu Cys Arg Asn Glu Glu
        195             200             205
Trp Leu Lys Val Thr Gln Gln Tyr Thr Ile Asp Gly Phe Gly Ala Ala
    210             215             220
Glu Asp Leu Arg Leu Trp Pro Ala Ala Leu Arg Pro Ile Val His Trp
225             230             235             240
Phe Leu Pro Ser Cys Gln Arg Ala Arg Ala Asp Val Arg Val Ala Arg
            245             250             255
Ser Ile Leu Asp Pro Val Leu Lys Lys Arg Arg Gln Glu Lys Ala Ala
            260             265             270
Asn Gly Gly Lys Ala Glu His Asp Asp Ala Ile Glu Trp Phe Glu Arg
        275             280             285
Thr Ala Lys Gly Lys Tyr Tyr Asp Pro Ala Val Ala Gln Leu Val Leu
        290             295             300
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Ser Leu Val Ala Ile His Thr Thr Ser Asp Leu Thr Cys Gln Val Met
305                 310                 315                 320
Thr Asn Leu Met Gln Asn Pro Glu Phe Ile Ala Pro Leu Arg Glu Glu
                325                 330                 335
Met Ile Gln Val Leu Ser Glu Gly Gly Trp Lys Lys Thr Ser Leu Tyr
                340                 345                 350
Asn Met Lys Leu Leu Asp Ser Val Ile Lys Glu Ser Gln Arg Val Lys
            355                 360                 365
Pro Thr Gly Val Ala Ser Met Arg Arg Tyr Ala Glu Lys Asp Val Thr
        370                 375                 380
Leu Ser Asp Gly Thr Phe Ile Pro Lys Gly Gly Phe Val Ala Val Ser
385                 390                 395                 400
Ala His Asp Met Trp Asn Ser Glu Val Tyr Glu Gln Ala Glu Lys Trp
                405                 410                 415
Asp Gly Arg Arg Phe Leu Arg Met Arg Glu Thr Pro Gly Ala Gly Lys
                420                 425                 430
Glu Asn Val Ala Gln Leu Val Ser Thr Ala Pro Glu His Leu Gly Phe
            435                 440                 445
Gly His Gly Gln His Ala Cys Pro Gly Arg Phe Phe Ala Ala Asn Glu
        450                 455                 460
Ile Lys Ile Ala Leu Val His Leu Leu Leu Asn Tyr Glu Trp Arg Leu
465                 470                 475                 480
Pro Glu Gly Ser Asp Pro Lys Ile Arg Thr Phe Gly Phe Ser Met Gly
                485                 490                 495
Val Asp Pro Ser Leu Lys Val Glu Tyr Lys Gly Arg Gln Pro Glu Ile
                500                 505                 510
Glu Leu
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<210> 29
<211> 495
<212> PRT
<213> Catharanthus roseus CAB56503

<400> 29
Leu Leu Phe Cys Phe Ile Leu Ser Lys Thr Thr Lys Lys Phe Gly Gln
 1               5                 10                  15
Asn Ser Gln Tyr Ser Asn His Asp Glu Leu Pro Pro Gly Pro Pro Gln
                20                  25                  30
Ile Pro Ile Leu Gly Asn Ala His Gln Leu Ser Gly Gly His Thr His
        35                  40                  45
His Ile Leu Arg Asp Leu Ala Lys Lys Tyr Gly Pro Leu Met His Leu
        50                  55                  60
Lys Ile Gly Glu Val Ser Thr Ile Val Ala Ser Ser Pro Gln Ile Ala
65                  70                  75                  80
Glu Glu Ile Phe Arg Thr His Asp Ile Leu Phe Ala Asp Arg Pro Ser
                85                  90                  95
Asn Leu Glu Ser Phe Lys Ile Val Ser Tyr Asp Phe Ser Asp Met Val
                100                 105                 110
Val Ser Pro Tyr Gly Asn Tyr Trp Arg Gln Leu Arg Lys Ile Ser Met
                115                 120                 125
Met Glu Leu Leu Ser Gln Lys Ser Val Gln Ser Phe Arg Ser Ile Arg
        130                 135                 140
Glu Glu Glu Val Leu Asn Phe Ile Lys Ser Ile Gly Ser Lys Glu Gly
145                 150                 155                 160
Thr Arg Ile Asn Leu Ser Lys Glu Ile Ser Leu Leu Ile Tyr Gly Ile
                165                 170                 175
```

```
Thr Thr Arg Ala Ala Phe Gly Glu Lys Asn Lys Asn Thr Glu Glu Phe
            180                 185                 190
Ile Arg Leu Leu Asp Gln Leu Thr Lys Ala Val Ala Glu Pro Asn Ile
            195                 200                 205
Ala Asp Met Phe Pro Ser Leu Lys Phe Leu Gln Leu Ile Ser Thr Ser
            210                 215                 220
Lys Tyr Lys Ile Glu Lys Ile His Lys Gln Phe Asp Val Ile Val Glu
225                 230                 235                 240
Thr Ile Leu Lys Gly His Lys Glu Lys Ile Asn Lys Pro Leu Ser Gln
            245                 250                 255
Glu Asn Gly Glu Lys Lys Glu Asp Leu Val Asp Val Leu Leu Asn Ile
            260                 265                 270
Gln Arg Arg Asn Asp Phe Glu Ala Pro Leu Gly Asp Lys Asn Ile Lys
            275                 280                 285
Ala Ile Ile Phe Asn Ile Phe Ser Ala Gly Thr Glu Thr Ser Ser Thr
            290                 295                 300
Thr Val Asp Trp Ala Met Cys Glu Met Ile Lys Asn Pro Thr Val Met
305                 310                 315                 320
Lys Lys Ala Gln Glu Glu Val Arg Lys Val Phe Asn Glu Glu Gly Asn
            325                 330                 335
Val Asp Glu Thr Lys Leu His Gln Leu Lys Tyr Leu Gln Ala Val Ile
            340                 345                 350
Lys Glu Thr Leu Arg Leu His Pro Pro Val Pro Leu Leu Leu Pro Arg
            355                 360                 365
Glu Cys Arg Glu Gln Cys Lys Ile Lys Gly Tyr Thr Ile Pro Ser Lys
            370                 375                 380
Ser Arg Val Ile Val Asn Ala Trp Ala Ile Gly Arg Asp Pro Asn Tyr
385                 390                 395                 400
Trp Ile Glu Pro Glu Lys Phe Asn Pro Asp Arg Phe Leu Glu Ser Lys
            405                 410                 415
Val Asp Phe Lys Gly Asn Ser Phe Glu Tyr Leu Pro Phe Gly Gly Gly
            420                 425                 430
Arg Arg Ile Cys Pro Gly Ile Thr Phe Ala Leu Ala Asn Ile Glu Leu
            435                 440                 445
Pro Leu Ala Gln Leu Leu Phe His Phe Asp Trp Gln Ser Asn Thr Glu
            450                 455                 460
Lys Leu Asn Met Lys Glu Ser Arg Gly Val Thr Val Arg Arg Glu Asp
465                 470                 475                 480
Asp Leu Tyr Leu Thr Pro Val Asn Phe Ser Ser Ser Ser Pro Ala
            485                 490                 495


<210> 30
<211> 510
<212> PRT
<213> Glycine max AAB94588


<400> 30
Met Val Met Glu Leu His Asn His Thr Pro Phe Ser Ile Tyr Phe Ile
1               5                   10                  15
Thr Ser Ile Leu Phe Ile Phe Phe Val Phe Phe Lys Leu Val Gln Arg
            20                  25                  30
Ser Asp Ser Lys Thr Ser Ser Thr Cys Lys Leu Pro Pro Gly Pro Arg
            35                  40                  45
Thr Leu Pro Leu Ile Gly Asn Ile His Gln Ile Val Gly Ser Leu Pro
            50                  55                  60
Val His Tyr Tyr Leu Lys Asn Leu Ala Asp Lys Tyr Gly Pro Leu Met
65                  70                  75                  80
```

His Leu Lys Leu Gly Glu Val Ser Asn Ile Ile Val Thr Ser Pro Glu
                85   90   95

Met Ala Gln Glu Ile Met Lys Thr His Asp Leu Asn Phe Ser Asp Arg
                100   105   110

Pro Asp Phe Val Leu Ser Arg Ile Val Ser Tyr Asn Gly Ser Gly Ile
                115   120   125

Val Phe Ser Gln His Gly Asp Tyr Trp Arg Gln Leu Arg Lys Ile Cys
        130   135   140

Thr Val Glu Leu Leu Thr Ala Lys Arg Val Gln Ser Phe Arg Ser Ile
    145   150   155   160

Arg Glu Glu Glu Val Ala Glu Leu Val Lys Lys Ile Ala Ala Thr Ala
                165   170   175

Ser Glu Glu Gly Gly Ser Ile Phe Asn Leu Thr Gln Ser Ile Tyr Ser
                180   185   190

Met Thr Phe Gly Ile Ala Ala Arg Ala Ala Phe Gly Lys Lys Ser Arg
        195   200   205

Tyr Gln Gln Val Phe Ile Ser Asn Met His Lys Gln Leu Met Leu Leu
    210   215   220

Gly Gly Phe Ser Val Ala Asp Leu Tyr Pro Ser Ser Arg Val Phe Gln
225   230   235   240

Met Met Gly Ala Thr Gly Lys Leu Glu Lys Val His Arg Val Thr Asp
                245   250   255

Arg Val Leu Gln Asp Ile Ile Asp Glu His Lys Asn Arg Asn Arg Ser
                260   265   270

Ser Glu Glu Arg Glu Ala Val Glu Asp Leu Val Asp Val Leu Leu Lys
        275   280   285

Phe Gln Lys Glu Ser Glu Phe Arg Leu Thr Asp Asp Asn Ile Lys Ala
        290   295   300

Val Ile Gln Asp Ile Phe Ile Gly Gly Gly Glu Thr Ser Ser Ser Val
305   310   315   320

Val Glu Trp Gly Met Ser Glu Leu Ile Arg Asn Pro Arg Val Met Glu
                325   330   335

Glu Ala Gln Ala Glu Val Arg Arg Val Tyr Asp Ser Lys Gly Tyr Val
        340   345   350

Asp Glu Thr Glu Leu His Gln Leu Ile Tyr Leu Lys Ser Ile Ile Lys
        355   360   365

Glu Thr Met Arg Leu His Pro Pro Val Pro Leu Leu Val Pro Arg Val
    370   375   380

Ser Arg Glu Arg Cys Gln Ile Asn Gly Tyr Glu Ile Pro Ser Lys Thr
385   390   395   400

Arg Ile Ile Ile Asn Ala Trp Ala Ile Gly Arg Asn Pro Lys Tyr Trp
                405   410   415

Gly Glu Thr Glu Ser Phe Lys Pro Glu Arg Phe Leu Asn Ser Ser Ile
                420   425   430

Asp Phe Arg Gly Thr Asp Phe Glu Phe Ile Pro Phe Gly Ala Gly Arg
        435   440   445

Arg Ile Cys Pro Gly Ile Thr Phe Ala Ile Pro Asn Ile Glu Leu Pro
    450   455   460

Leu Ala Gln Leu Leu Tyr His Phe Asp Trp Lys Leu Pro Asn Lys Met
465   470   475   480

Lys Asn Glu Glu Leu Asp Met Thr Glu Ser Asn Gly Ile Thr Leu Arg
                485   490   495

Arg Gln Asn Asp Leu Cys Leu Ile Pro Ile Thr Arg Leu Pro
                500   505   510

<210> 31
<211> 524

<212> PRT
<213> Gibberella fujikuroi CAA75566

<400> 31

```
Met Ser Ile Phe Asn Met Ile Thr Ser Tyr Ala Gly Ser Gln Leu Leu
1               5                   10                  15
Pro Phe Tyr Ile Ala Ile Phe Val Phe Thr Leu Val Pro Trp Ala Ile
            20                  25                  30
Arg Phe Ser Trp Leu Glu Leu Arg Lys Gly Ser Val Val Pro Leu Ala
        35                  40                  45
Asn Pro Pro Asp Ser Leu Phe Gly Thr Gly Lys Thr Arg Arg Ser Phe
    50                  55                  60
Val Lys Leu Ser Arg Glu Ile Leu Ala Lys Ala Arg Ser Leu Phe Pro
65                  70                  75                  80
Asn Glu Pro Phe Arg Leu Ile Thr Asp Trp Gly Glu Val Leu Ile Leu
                85                  90                  95
Pro Pro Asp Phe Ala Asp Glu Ile Arg Asn Asp Pro Arg Leu Ser Phe
            100                 105                 110
Ser Lys Ala Ala Met Gln Asp Asn His Ala Gly Ile Pro Gly Phe Glu
        115                 120                 125
Thr Val Ala Leu Val Gly Arg Glu Asp Gln Leu Ile Gln Lys Val Ala
        130                 135                 140
Arg Lys Gln Leu Thr Lys His Leu Ser Ala Val Ile Glu Pro Leu Ser
145                 150                 155                 160
Arg Glu Ser Thr Leu Ala Val Ser Leu Asn Phe Gly Glu Thr Thr Glu
                165                 170                 175
Trp Arg Ala Ile Arg Leu Lys Pro Ala Ile Leu Asp Ile Ile Ala Arg
            180                 185                 190
Ile Ser Ser Arg Ile Tyr Leu Gly Asp Gln Leu Cys Arg Asn Glu Ala
        195                 200                 205
Trp Leu Lys Ile Thr Lys Thr Tyr Thr Thr Asn Phe Tyr Thr Ala Ser
    210                 215                 220
Thr Asn Leu Arg Met Phe Pro Arg Ser Ile Arg Pro Leu Ala His Trp
225                 230                 235                 240
Phe Leu Pro Glu Cys Arg Lys Leu Arg Gln Glu Arg Lys Asp Ala Ile
                245                 250                 255
Gly Ile Ile Thr Pro Leu Ile Glu Arg Arg Arg Glu Leu Arg Arg Ala
            260                 265                 270
Ala Ile Ala Ala Gly Gln Pro Leu Pro Val Phe His Asp Ala Ile Asp
        275                 280                 285
Trp Ser Glu Gln Glu Ala Glu Ala Ala Gly Thr Gly Ala Ser Phe Asp
    290                 295                 300
Pro Val Ile Phe Gln Leu Thr Leu Ser Leu Leu Ala Ile His Thr Thr
305                 310                 315                 320
Tyr Asp Leu Leu Gln Gln Thr Met Ile Asp Leu Gly Arg His Pro Glu
                325                 330                 335
Tyr Ile Glu Pro Leu Arg Gln Glu Val Val Gln Leu Leu Arg Glu Glu
            340                 345                 350
Gly Trp Lys Lys Thr Thr Leu Phe Lys Met Lys Leu Leu Asp Ser Ala
        355                 360                 365
Ile Lys Glu Ser Gln Arg Met Lys Pro Gly Ser Ile Val Thr Met Arg
    370                 375                 380
Arg Tyr Val Thr Glu Asp Ile Thr Leu Ser Ser Gly Leu Thr Leu Lys
385                 390                 395                 400
Lys Gly Thr Arg Leu Asn Val Asp Asn Arg Arg Leu Asp Asp Pro Lys
                405                 410                 415
Ile Tyr Asp Asn Pro Glu Val Tyr Asn Pro Tyr Arg Phe Tyr Asp Met
```

```
                420                 425                 430
Arg Ser Glu Ala Gly Lys Asp His Gly Ala Gln Leu Val Ser Thr Gly
            435                 440                 445
Ser Asn His Met Gly Phe Gly His Gly Gln His Ser Cys Pro Gly Arg
      450                 455                 460
Phe Phe Ala Ala Asn Glu Ile Lys Val Ala Leu Cys His Ile Leu Val
465                 470                 475                 480
Lys Tyr Asp Trp Lys Leu Cys Pro Asp Thr Glu Thr Lys Pro Asp Thr
                485                 490                 495
Arg Gly Met Ile Ala Lys Ser Ser Pro Val Thr Asp Ile Leu Ile Lys
            500                 505                 510
Arg Arg Glu Ser Val Glu Leu Asp Leu Glu Ala Ile
      515                 520
```

<210> 32
<211> 528
<212> PRT
<213> Aspergillus terreus AAD34552

<400> 32

```
Met Thr Val Asp Ala Leu Thr Gln Pro His His Leu Leu Ser Leu Ala
  1               5                  10                  15
Trp Asn Asp Thr Gln Gln His Gly Ser Trp Phe Ala Pro Leu Val Thr
              20                  25                  30
Thr Ser Ala Gly Leu Leu Cys Leu Leu Leu Tyr Leu Cys Ser Ser Gly
        35                  40                  45
Arg Arg Ser Asp Leu Pro Val Phe Asn Pro Lys Thr Trp Trp Glu Leu
      50                  55                  60
Thr Thr Met Arg Ala Lys Arg Asp Phe Asp Ala Asn Ala Pro Ser Trp
65                  70                  75                  80
Ile Glu Ser Trp Phe Ser Gln Asn Asp Lys Pro Ile Arg Phe Ile Val
                85                  90                  95
Asp Ser Gly Tyr Cys Thr Ile Leu Pro Ser Ser Met Ala Asp Glu Phe
              100                 105                 110
Arg Lys Met Lys Glu Leu Cys Met Tyr Lys Phe Leu Gly Thr Asp Phe
            115                 120                 125
His Ser His Leu Pro Gly Phe Asp Gly Phe Lys Glu Val Thr Arg Asp
        130                 135                 140
Ala His Leu Ile Thr Lys Val Val Met Asn Gln Phe Gln Thr Gln Ala
145                 150                 155                 160
Pro Lys Tyr Val Lys Pro Leu Ala Asn Glu Ala Ser Gly Ile Ile Thr
                165                 170                 175
Asp Ile Phe Gly Asp Ser Asn Glu Trp His Thr Val Pro Val Tyr Asn
              180                 185                 190
Gln Cys Leu Asp Leu Val Thr Arg Thr Val Thr Phe Ile Met Val Gly
            195                 200                 205
Ser Lys Leu Ala His Asn Glu Glu Trp Leu Asp Ile Ala Lys His His
        210                 215                 220
Ala Val Thr Met Ala Ile Gln Ala Arg Gln Leu Arg Leu Trp Pro Val
225                 230                 235                 240
Ile Leu Arg Pro Leu Val His Trp Leu Glu Pro Gln Gly Ala Lys Leu
                245                 250                 255
Arg Ala Gln Val Arg Arg Ala Arg Gln Leu Leu Asp Pro Ile Ile Gln
            260                 265                 270
Glu Arg Arg Ala Glu Arg Asp Ala Cys Arg Ala Lys Gly Ile Glu Pro
        275                 280                 285
Pro Arg Tyr Val Asp Ser Ile Gln Trp Phe Glu Asp Thr Ala Lys Gly
```

```
                290                  295                  300
Lys Trp Tyr Asp Ala Ala Gly Ala Gln Leu Ala Met Asp Phe Ala Gly
305                  310                  315                  320
Ile Tyr Gly Thr Ser Asp Leu Leu Ile Gly Gly Leu Val Asp Ile Val
                    325                  330                  335
Arg His Pro His Leu Leu Glu Pro Leu Arg Asp Glu Ile Arg Thr Val
                340                  345                  350
Ile Gly Gln Gly Gly Trp Thr Pro Ala Ser Leu Tyr Lys Leu Lys Leu
                355                  360                  365
Leu Asp Ser Cys Leu Lys Glu Ser Gln Arg Val Lys Pro Val Glu Cys
370                  375                  380
Ala Thr Met Arg Ser Tyr Ala Leu Gln Asp Val Thr Phe Ser Asn Gly
385                  390                  395                  400
Thr Phe Ile Pro Lys Gly Glu Leu Val Ala Val Ala Ala Asp Arg Met
                    405                  410                  415
Ser Asn Pro Glu Val Trp Pro Glu Pro Ala Lys Tyr Asp Pro Tyr Arg
                420                  425                  430
Tyr Met Arg Leu Arg Glu Asp Pro Ala Lys Ala Phe Ser Ala Gln Leu
                435                  440                  445
Glu Asn Thr Asn Gly Asp His Ile Gly Phe Gly Trp His Pro Arg Ala
                450                  455                  460
Cys Pro Gly Arg Phe Phe Ala Ser Lys Glu Ile Lys Met Met Leu Ala
465                  470                  475                  480
Tyr Leu Leu Ile Arg Tyr Asp Trp Lys Val Val Pro Asp Glu Pro Leu
                    485                  490                  495
Gln Tyr Tyr Arg His Ser Phe Ser Val Arg Ile His Pro Thr Thr Lys
                500                  505                  510
Leu Met Met Arg Arg Arg Asp Glu Asp Ile Arg Leu Pro Gly Ser Leu
                515                  520                  525
```

<210> 33
<211> 388
<212> PRT
<213> Gibberella fujikuroi CAA75567

<400> 33

```
Met Lys Tyr Thr Thr Cys Gln Met Asn Ile Phe Pro Ser Leu Trp Ser
1               5                   10                  15
Met Lys Thr Ser Phe Arg Trp Pro Arg Thr Ser Lys Trp Ser Ser Val
                20                  25                  30
Ser Leu Tyr Asp Met Met Leu Arg Thr Val Ala Leu Leu Ser Gly Arg
            35                  40                  45
Ala Phe Val Gly Leu Pro Leu Cys Arg Asp Glu Gly Trp Leu Gln Ala
            50                  55                  60
Ser Ile Gly Tyr Thr Val Gln Cys Val Ser Ile Arg Asp Gln Leu Phe
65                  70                  75                  80
Thr Trp Ser Pro Val Leu Arg Pro Ile Ile Gly Pro Phe Leu Pro Ser
                    85                  90                  95
Val Arg Ser Val Arg Arg His Leu Arg Phe Ala Ala Glu Ile Met Ala
                100                 105                 110
Pro Leu Ile Ser Gln Ala Leu Gln Asp Glu Lys Gln His Arg Ala Asp
            115                 120                 125
Thr Leu Leu Ala Asp Gln Thr Glu Gly Arg Gly Thr Phe Ile Ser Trp
            130                 135                 140
Leu Leu Arg His Leu Pro Glu Glu Leu Arg Thr Pro Glu Gln Val Gly
145                 150                 155                 160
Leu Asp Gln Met Leu Val Ser Phe Ala Ala Ile His Thr Thr Thr Met
```

```
                    165                 170                 175
     Ala Leu Thr Lys Val Val Trp Glu Leu Val Lys Arg Pro Glu Tyr Ile
                180                 185                 190
     Glu Pro Leu Arg Thr Glu Met Gln Asp Val Phe Gly Pro Asp Ala Val
                    195                 200                 205
     Ser Pro Asp Ile Cys Ile Asn Lys Glu Ala Leu Ser Arg Leu His Lys
             210                 215                 220
     Leu Asp Ser Phe Ile Arg Glu Val Gln Arg Trp Cys Pro Ser Thr Phe
     225                 230                 235                 240
     Val Thr Pro Ser Arg Arg Val Met Lys Ser Met Thr Leu Ser Asn Gly
                     245                 250                 255
     Ile Lys Leu Gln Arg Gly Thr Ser Ile Ala Phe Pro Ala His Ala Ile
                 260                 265                 270
     His Met Ser Glu Glu Thr Pro Thr Phe Ser Pro Asp Phe Ser Ser Asp
                 275                 280                 285
     Phe Glu Asn Pro Ser Pro Arg Ile Phe Asp Gly Phe Arg Tyr Leu Asn
                 290                 295                 300
     Leu Arg Ser Ile Lys Gly Gln Gly Ser Gln His Gln Ala Ala Thr Thr
     305                 310                 315                 320
     Gly Pro Asp Tyr Leu Ile Phe Asn His Gly Lys His Ala Cys Pro Gly
                     325                 330                 335
     Arg Phe Phe Ala Ile Ser Glu Ile Lys Met Ile Leu Ile Glu Leu Leu
                 340                 345                 350
     Ala Lys Tyr Asp Phe Arg Leu Glu Asp Gly Lys Pro Gly Pro Glu Leu
                 355                 360                 365
     Met Arg Val Gly Thr Glu Thr Arg Leu Asp Thr Lys Ala Gly Leu Glu
                 370                 375                 380
     Met Arg Arg Arg
     385


     <210> 34
     <211> 525
     <212> PRT
     <213> Gibberella fujikuroi CAA76703

     <400> 34
     Met Ser Lys Ser Asn Ser Met Asn Ser Thr Ser His Glu Thr Leu Phe
     1               5                   10                  15
     Gln Gln Leu Val Leu Gly Leu Asp Arg Met Pro Leu Met Asp Val His
                 20                  25                  30
     Trp Leu Ile Tyr Val Ala Phe Gly Ala Trp Leu Cys Ser Tyr Val Ile
                 35                  40                  45
     His Val Leu Ser Ser Ser Ser Thr Val Lys Val Pro Val Val Gly Tyr
             50                  55                  60
     Arg Ser Val Phe Glu Pro Thr Trp Leu Leu Arg Leu Arg Phe Val Trp
     65                  70                  75                  80
     Glu Gly Gly Ser Ile Ile Gly Gln Gly Tyr Asn Lys Phe Lys Asp Ser
                     85                  90                  95
     Ile Phe Gln Val Arg Lys Leu Gly Thr Asp Ile Val Ile Ile Pro Pro
                 100                 105                 110
     Asn Tyr Ile Asp Glu Val Arg Lys Leu Ser Gln Asp Lys Thr Arg Ser
                 115                 120                 125
     Val Glu Pro Phe Ile Asn Asp Phe Ala Gly Gln Tyr Thr Arg Gly Met
             130                 135                 140
     Val Phe Leu Gln Ser Asp Leu Gln Asn Arg Val Ile Gln Gln Arg Leu
     145                 150                 155                 160
     Thr Pro Lys Leu Val Ser Leu Thr Lys Val Met Lys Glu Glu Leu Asp
```

```
                165              170              175
Tyr Ala Leu Thr Lys Glu Met Pro Asp Met Lys Asn Asp Glu Trp Val
            180              185              190
Glu Val Asp Ile Ser Ser Ile Met Val Arg Leu Ile Ser Arg Ile Ser
            195              200              205
Ala Arg Val Phe Leu Gly Pro Glu His Cys Arg Asn Gln Glu Trp Leu
            210              215              220
Thr Thr Thr Ala Glu Tyr Ser Glu Ser Leu Phe Ile Thr Gly Phe Ile
            225              230              235              240
Leu Arg Val Val Pro His Ile Leu Arg Pro Phe Ile Ala Pro Leu Leu
                245              250              255
Pro Ser Tyr Arg Thr Leu Leu Arg Asn Val Ser Ser Gly Arg Arg Val
                260              265              270
Ile Gly Asp Ile Ile Arg Ser Gln Gln Gly Asp Gly Asn Glu Asp Ile
            275              280              285
Leu Ser Trp Met Arg Asp Ala Ala Thr Gly Glu Glu Lys Gln Ile Asp
            290              295              300
Asn Ile Ala Gln Arg Met Leu Ile Leu Ser Leu Ala Ser Ile His Thr
            305              310              315              320
Thr Ala Met Thr Met Thr His Ala Met Tyr Asp Leu Cys Ala Cys Pro
                325              330              335
Glu Tyr Ile Glu Pro Leu Arg Asp Glu Val Lys Ser Val Val Gly Ala
                340              345              350
Ser Gly Trp Asp Lys Thr Ala Leu Asn Arg Phe His Lys Leu Asp Ser
                355              360              365
Phe Leu Lys Glu Ser Gln Arg Phe Asn Pro Val Phe Leu Leu Thr Phe
            370              375              380
Asn Arg Ile Tyr His Gln Ser Met Thr Leu Ser Asp Gly Thr Asn Ile
            385              390              395              400
Pro Ser Gly Thr Arg Ile Ala Val Pro Ser His Ala Met Leu Gln Asp
                405              410              415
Ser Ala His Val Pro Gly Pro Thr Pro Pro Thr Glu Phe Asp Gly Phe
                420              425              430
Arg Tyr Ser Lys Ile Arg Ser Asp Ser Asn Tyr Ala Gln Lys Tyr Leu
            435              440              445
Phe Ser Met Thr Asp Ser Ser Asn Met Ala Phe Gly Tyr Gly Lys Tyr
            450              455              460
Ala Cys Pro Gly Arg Phe Tyr Ala Ser Asn Glu Met Lys Leu Thr Leu
465              470              475              480
Ala Ile Leu Leu Leu Gln Phe Glu Phe Lys Leu Pro Asp Gly Lys Gly
                485              490              495
Arg Pro Arg Asn Ile Thr Ile Asp Ser Asp Met Ile Pro Asp Pro Arg
                500              505              510
Ala Arg Leu Cys Val Arg Lys Arg Ser Leu Arg Asp Glu
            515              520              525
```

```
<210> 35
<211> 294
<212> PRT
<213> Fusarium oxysporum CAA57874

<400> 35
Met Ala Pro Met Leu Arg Pro Leu Val Tyr Arg Phe Ile Pro Glu Arg
1               5               10              15
Ala Arg Ile Lys Asp Gln Trp Thr Lys Gly Arg Lys Arg Val Met Ala
            20              25              30
Ser Met Arg Glu Arg Gln Glu Lys Gly Gly Asn Leu Glu Asp Pro Pro
```

```
                35                      40                      45
Thr Met Leu Asp His Leu Ser Asn Gly Arg Asn Glu His Ile Ala Asp
        50                      55                      60
Asp Val Glu Leu Gln Leu Leu His Gln Met Thr Leu Ile Ala Val Gly
65                      70                      75                      80
Thr Val Thr Thr Phe Ser Ser Thr Thr Gln Ala Ile Tyr Asp Leu Val
                85                      90                      95
Ala His Pro Glu Tyr Ile Thr Ile Leu Arg Glu Glu Val Glu Ser Val
                100                     105                     110
Pro Arg Asp Pro Asn Gly Asn Phe Thr Lys Asp Ser Thr Val Ala Met
                115                     120                     125
Asp Lys Leu Asp Ser Phe Leu Lys Glu Ser Gln Arg Phe Asn Ser Pro
        130                     135                     140
Asp Leu Ser Met Ser Asn Leu Lys Asn Tyr Lys Leu Cys Glu Ser Leu
145                     150                     155                     160
Thr Gly His Ser Asn Leu Pro Thr Arg Thr Ile Ala Asp Met Lys Leu
                165                     170                     175
Pro Asp Gly Thr Phe Val Pro Lys Gly Thr Lys Leu Glu Ile Asn Thr
                180                     185                     190
Cys Ser Ile His Lys Asp His Lys Leu Tyr Glu Asn Pro Glu Gln Phe
                195                     200                     205
Asp Gly Leu Arg Phe His Lys Trp Arg Lys Ala Pro Gly Lys Glu Lys
        210                     215                     220
Arg Tyr Met Tyr Ser Ser Ser Gly Thr Asp Asp Leu Ser Trp Gly Phe
225                     230                     235                     240
Gly Arg His Ala Cys Pro Gly Arg Tyr Leu Ser Ala Ile Asn Ile Lys
                245                     250                     255
Leu Ile Met Ala Glu Leu Leu Met Asn Tyr Asp Ile Lys Leu Pro Asp
                260                     265                     270
Gly Leu Ser Arg Pro Lys Asn Ile Glu Phe Glu Val Leu Ala Ser Leu
        275                     280                     285
Asn Ala Cys Ala Asn Ala
        290


<210> 36
<211> 510
<212> PRT
<213> Caenorhabditis elegans CAA91268


<400> 36
Met Ala Leu Leu Ile Leu Ser Ser Leu Val Ile Ser Ile Phe Thr Phe
1                       5                       10                      15
Phe Ile Tyr Ile Ile Leu Ala Arg Arg Glu Arg Phe Lys Leu Arg Glu
                20                      25                      30
Lys Ile Gly Leu Ser Gly Pro Glu Pro His Trp Phe Leu Gly Asn Leu
        35                      40                      45
Lys Gln Thr Ala Glu Arg Lys Glu Lys Leu Gly Tyr Asp Asp Ala Asn
        50                      55                      60
Arg Trp Phe Asn Glu Leu His Glu Gln Tyr Gly Glu Thr Phe Gly Ile
65                      70                      75                      80
Tyr Tyr Gly Ser Gln Met Asn Ile Val Ile Ser Asn Glu Lys Asp Ile
                85                      90                      95
Lys Glu Val Phe Ile Lys Asn Phe Ser Asn Phe Ser Asp Arg Ser Val
                100                     105                     110
Pro Ser Ile Tyr Glu Ala Asn Gln Leu Thr Ala Ser Leu Leu Met Asn
                115                     120                     125
Ser Tyr Ser Ser Gly Trp Lys His Thr Arg Ser Ala Ile Ala Pro Ile
```

```
            130              135              140
Phe Ser Thr Gly Lys Met Lys Ala Met Gln Glu Thr Ile Asn Ser Lys
145              150              155              160
Val Asp Leu Phe Leu Asp Ile Leu Arg Glu Lys Ala Ser Ser Gly Gln
                165              170              175
Lys Trp Asp Ile Tyr Asp Asp Phe Gln Gly Leu Thr Leu Asp Val Ile
            180              185              190
Gly Lys Cys Ala Phe Ala Ile Asp Ser Asn Cys Gln Arg Asp Arg Asn
            195              200              205
Asp Val Phe Tyr His Pro Val Thr Val Lys Ile Thr Ile Asn Asn Phe
            210              215              220
Thr Tyr Phe His Ser Ser Ser Pro Gly Thr Phe His Phe Leu Glu Ser
225              230              235              240
Thr Leu Gln Ile His Thr Thr Gly Arg Cys Arg Asn Ser Thr Cys Arg
            245              250              255
Arg Thr Val Lys Cys Val Gly Phe Arg Gln Asp Lys Ala Lys Phe Cys
            260              265              270
Ser Asp Tyr Glu Arg Arg Arg Gly Gly Glu Gly Ser Asp Ser Val Asp
            275              280              285
Leu Leu Lys Leu Leu Leu Asn Arg Glu Asp Asp Lys Ser Lys Pro Met
            290              295              300
Thr Lys Gln Glu Val Ile Glu Asn Cys Phe Ala Phe Leu Leu Ala Gly
305              310              315              320
Tyr Glu Thr Thr Ser Thr Ala Met Thr Tyr Cys Ser Tyr Leu Leu Ser
            325              330              335
Lys Tyr Pro Asn Val Gln Gln Lys Leu Tyr Glu Glu Ile Met Glu Ala
            340              345              350
Lys Glu Asn Gly Gly Leu Thr Tyr Asp Ser Ile His Asn Met Lys Tyr
            355              360              365
Leu Asp Cys Val Tyr Lys Glu Thr Leu Arg Phe Tyr Pro Pro His Phe
            370              375              380
Ser Phe Ile Arg Arg Leu Cys Arg Glu Asp Ile Thr Ile Arg Gly Gln
385              390              395              400
Phe Tyr Pro Lys Gly Ala Ile Val Val Cys Leu Pro His Thr Val His
            405              410              415
Arg Asn Pro Glu Asn Trp Asp Ser Pro Glu Glu Phe His Pro Glu Arg
            420              425              430
Phe Glu Asn Trp Glu Glu Lys Ser Ser Ser Leu Lys Trp Ile Pro Phe
            435              440              445
Gly Val Gly Pro Arg Tyr Cys Val Gly Met Arg Phe Ala Glu Met Glu
            450              455              460
Phe Lys Thr Thr Ile Val Lys Leu Leu Asp Thr Phe Glu Leu Lys Gln
465              470              475              480
Phe Glu Gly Glu Ala Asp Leu Ile Pro Asp Cys Asn Gly Val Ile Met
            485              490              495
Arg Pro Asn Asp Pro Val Arg Leu His Leu Lys Pro Arg Asn
            500              505              510
```

```
<210> 37
<211> 691
<212> PRT
<213> yeast P450 reductase

<400> 37
Met Pro Phe Gly Ile Asp Asn Thr Asp Phe Thr Val Leu Ala Gly Leu
    1               5               10              15
Val Leu Ala Val Leu Leu Tyr Val Lys Arg Asn Ser Ile Lys Glu Leu
```

```
                  20                    25                    30
       Leu Met Ser Asp Asp Gly Asp Ile Thr Ala Val Ser Ser Gly Asn Arg
                  35                    40                    45
       Asp Ile Ala Gln Val Val Thr Glu Asn Asn Lys Asn Tyr Leu Val Leu
  5               50                    55                    60
       Tyr Ala Ser Gln Thr Gly Thr Ala Glu Asp Tyr Ala Lys Lys Phe Ser
       65                    70                    75                    80
       Lys Glu Leu Val Ala Lys Phe Asn Leu Asn Val Met Cys Ala Asp Val
                        85                    90                    95
 10    Glu Asn Tyr Asp Phe Glu Ser Leu Asn Asp Val Pro Val Ile Val Ser
                      100                   105                   110
       Ile Phe Ile Ser Thr Tyr Gly Glu Gly Asp Phe Pro Asp Gly Ala Val
                  115                   120                   125
       Asn Phe Glu Asp Phe Ile Cys Asn Ala Glu Ala Gly Ala Leu Ser Asn
 15               130                   135                   140
       Leu Arg Tyr Asn Met Phe Gly Leu Gly Asn Ser Thr Tyr Glu Phe Phe
       145                   150                   155                   160
       Asn Gly Ala Ala Lys Lys Ala Glu Lys His Leu Ser Ala Ala Gly Ala
                      165                   170                   175
 20    Ile Arg Leu Gly Lys Leu Gly Glu Ala Asp Asp Gly Ala Gly Thr Thr
                  180                   185                   190
       Asp Glu Asp Tyr Met Ala Trp Lys Asp Ser Ile Leu Glu Val Leu Lys
                  195                   200                   205
       Asp Glu Leu His Leu Asp Glu Gln Glu Ala Lys Phe Thr Ser Gln Phe
 25               210                   215                   220
       Gln Tyr Thr Val Leu Asn Glu Ile Thr Asp Ser Met Ser Leu Gly Glu
       225                   230                   235                   240
       Pro Ser Ala His Tyr Leu Pro Ser His Gln Leu Asn Arg Asn Ala Asp
                      245                   250                   255
 30    Gly Ile Gln Leu Gly Pro Phe Asp Leu Ser Gln Pro Tyr Ile Ala Pro
                  260                   265                   270
       Ile Val Lys Ser Arg Glu Leu Phe Ser Ser Asn Asp Arg Asn Cys Ile
                  275                   280                   285
       His Ser Glu Phe Asp Leu Ser Gly Ser Asn Ile Lys Tyr Ser Thr Gly
 35               290                   295                   300
       Asp His Leu Ala Val Trp Pro Ser Asn Pro Leu Glu Lys Val Glu Gln
       305                   310                   315                   320
       Phe Leu Ser Ile Phe Asn Leu Asp Pro Glu Thr Ile Phe Asp Leu Lys
                      325                   330                   335
 40    Pro Leu Asp Pro Thr Val Lys Val Pro Phe Pro Thr Pro Thr Thr Ile
                  340                   345                   350
       Gly Ala Ala Ile Lys His Tyr Leu Glu Ile Thr Gly Pro Val Ser Arg
                  355                   360                   365
       Gln Leu Phe Ser Ser Leu Ile Gln Phe Ala Pro Asn Ala Asp Val Lys
 45               370                   375                   380
       Glu Lys Leu Thr Leu Leu Ser Lys Asp Lys Asp Gln Phe Ala Val Glu
       385                   390                   395                   400
       Ile Thr Ser Lys Tyr Phe Asn Ile Ala Asp Ala Leu Lys Tyr Leu Ser
                      405                   410                   415
 50    Asp Gly Ala Lys Trp Asp Asn Val Pro Met Gln Phe Leu Val Glu Ser
                  420                   425                   430
       Val Pro Gln Met Thr Pro Arg Tyr Tyr Ser Ile Ser Ser Ser Ser Leu
                  435                   440                   445
       Ser Glu Lys Gln Thr Val His Val Thr Ser Ile Val Glu Asn Phe Pro
 55               450                   455                   460
       Asn Pro Glu Leu Pro Asp Ala Pro Pro Gly Val Gly Val Thr Thr Asn
       465                   470                   475                   480
```

Leu Leu Arg Asn Ile Gln Leu Ala Gln Asn Asn Val Asn Ile Ala Glu
                485   490   495
Thr Asn Leu Pro Val His Tyr Asp Leu Asn Gly Pro Arg Lys Leu Phe
                500   505   510
Ala Asn Tyr Lys Leu Pro Val His Val Arg Arg Ser Asn Phe Arg Leu
                515   520   525
Pro Ser Asn Pro Ser Thr Pro Val Ile Met Ile Gly Pro Gly Thr Gly
                530   535   540
Val Ala Pro Phe Arg Gly Phe Ile Arg Glu Arg Val Ala Phe Leu Glu
545   550   555   560
Ser Gln Lys Lys Gly Gly Asn Asn Val Ser Leu Gly Lys His Ile Leu
                565   570   575
Phe Tyr Gly Ser Arg Asn Thr Asp Asp Phe Leu Tyr Gln Asp Glu Trp
                580   585   590
Pro Glu Tyr Ala Lys Lys Leu Asp Gly Ser Phe Glu Met Val Val Ala
                595   600   605
His Ser Arg Leu Pro Asn Thr Lys Lys Val Tyr Val Gln Asp Lys Leu
                610   615   620
Lys Asp Tyr Glu Asp Gln Val Phe Glu Met Ile Asn Asn Gly Ala Phe
625   630   635   640
Ile Tyr Val Cys Gly Asp Ala Lys Gly Met Ala Lys Gly Val Ser Thr
                645   650   655
Ala Leu Val Gly Ile Leu Ser Arg Gly Lys Ser Ile Thr Thr Asp Glu
                660   665   670
Ala Thr Glu Leu Ile Lys Met Leu Lys Thr Ser Gly Arg Tyr Gln Glu
                675   680   685
Asp Val Trp
        690

<400> 38
Met Ala Gln Leu Asp Thr Leu Asp Leu Val Val Leu Ala Val Leu Leu
    1   5   10   15
Val Gly Ser Val Ala Tyr Phe Thr Lys Gly Thr Tyr Trp Ala Val Ala
                20   25   30
Lys Thr Arg Met Pro Leu Pro Ala Pro Arg Met Asn Gly Ala Ala Lys
                35   40   45
Ala Gly Lys Thr Arg Asn Ile Ile Glu Lys Met Glu Glu Thr Gly Lys
                50   55   60
Asn Cys Val Ile Phe Tyr Gly Ser Gln Thr Gly Thr Ala Glu Asp Tyr
65   70   75   80
Ala Ser Arg Leu Ala Lys Glu Gly Ser Gln Arg Phe Gly Leu Lys Thr
                85   90   95
Met Val Ala Asp Leu Glu Glu Tyr Asp Tyr Glu Asn Leu Asp Gln Phe
                100   105   110
Pro Glu Asp Lys Val Ala Phe Phe Val Leu Ala Thr Tyr Gly Glu Gly
                115   120   125
Glu Pro Thr Asp Asn Ala Val Glu Phe Tyr Gln Phe Phe Thr Gly Asp
                130   135   140
Asp Val Ala Phe Glu Ser Ala Ser Ala Asp Glu Lys Pro Leu Ser Lys
145   150   155   160
Leu Lys Tyr Val Ala Phe Gly Leu Gly Asn Asn Thr Tyr Glu His Tyr
                165   170   175

Asn Ala Met Val Arg Gln Val Asp Ala Ala Phe Gln Lys Leu Gly Pro
                180   185   190

Gln Arg Ile Gly Ser Ala Gly Glu Gly Asp Asp Gly Ala Gly Thr Met
                195   200   205

Glu Glu Asp Phe Leu Ala Trp Lys Glu Pro Met Trp Ala Ala Leu Ser
        210   215   220

Glu Ser Met Asp Leu Glu Glu Arg Glu Ala Val Tyr Glu Pro Val Phe
225   230   235   240

Cys Val Thr Glu Asn Glu Ser Leu Ser Pro Glu Asp Glu Thr Val Tyr
                245   250   255

Leu Gly Glu Pro Thr Gln Ser His Leu Gln Gly Thr Pro Lys Gly Pro
                260   265   270

Tyr Ser Ala His Asn Pro Phe Ile Ala Pro Ile Ala Glu Ser Arg Glu
                275   280   285

Leu Phe Thr Val Lys Asp Arg Asn Cys Leu His Met Glu Ile Ser Ile
        290   295   300

Ala Gly Ser Asn Leu Ser Tyr Gln Thr Gly Asp His Ile Ala Val Trp
305   310   315   320

Pro Thr Asn Ala Gly Ala Glu Val Asp Arg Phe Leu Gln Val Phe Gly
                325   330   335

Leu Glu Gly Lys Arg Asp Ser Val Ile Asn Ile Lys Gly Ile Asp Val
                340   345   350

Thr Ala Lys Val Pro Ile Pro Thr Pro Thr Thr Tyr Asp Ala Ala Val
                355   360   365

Arg Tyr Tyr Met Glu Val Cys Ala Pro Val Ser Arg Gln Phe Val Ala
        370   375   380

Thr Leu Ala Ala Phe Ala Pro Met Arg Lys Ala Arg Gln Arg Leu Cys
385   390   395   400

Val Trp Val Ala Gln Gly Leu Phe Pro Arg Glu Gly His Gln Pro Met
                405   410   415

Leu Gln His Ala Gln Ala Leu Gln Ser Ile Thr Ser Lys Pro Phe Ser
                420   425   430

Ala Val Pro Phe Ser Leu Leu Ile Glu Gly Ile Thr Lys Leu Gln Pro
                435   440   445

Arg Tyr Tyr Ser Ile Ser Ser Ser Ser Leu Val Gln Lys Asp Lys Ile
        450   455   460

Ser Ile Thr Ala Val Val Glu Ser Val Arg Leu Pro Gly Ala Ser His
465   470   475   480

Met Val Lys Gly Val Thr Thr Asn Tyr Leu Leu Ala Leu Lys Gln Lys
                485   490   495

Gln Asn Gly Arg Ser Leu Ser Arg Pro Ser Arg Leu Asp Leu Leu His
                500   505   510

His Gly Pro Arg Asn Lys Tyr Asp Gly Ile His Val Pro Val His Val
                515   520   525

Arg His Ser Asn Phe Lys Leu Pro Ser Asp Pro Ser Arg Pro Ile Ile
        530   535   540

Met Val Gly Pro Gly Thr Gly Val Ala Pro Phe Arg Gly Phe Ile Gln
545   550   555   560

Glu Arg Ala Ala Leu Ala Ala Lys Gly Glu Lys Val Gly Pro Thr Val
                565   570   575

Leu Phe Phe Gly Cys Arg Lys Ser Asp Glu Asp Phe Leu Tyr Lys Asp
                580   585   590

Glu Trp Lys Thr Tyr Gln Asp Gln Leu Gly Asp Asn Leu Lys Ile Ile
                595   600   605

Thr Ala Phe Ser Arg Glu Gly Pro Gln Lys Val Tyr Val Gln His Arg
                610   615   620

Leu Arg Glu His Ser Glu Leu Val Ser Asp Leu Leu Lys Gln Lys Ala

```
                625                 630                 635                 640
         Thr Phe Tyr Val Cys Gly Asp Ala Ala Asn Met Ala Arg Glu Val Asn
                            645                 650                 655
         Leu Val Leu Gly Gln Ile Ile Ala Ala Gln Arg Gly Leu Pro Ala Glu
                            660                 665                 670
         Lys Gly Glu Glu Met Val Lys His Met Arg Arg Arg Gly Arg Tyr Gln
                            675                 680                 685
         Glu Asp Val Trp Ser
                            690
```

<210> 39

<211> 678

<212> PRT

<213> mouse

<400> 39

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         Met Gly Asp Ser His Glu Asp Thr Ser Ala Thr Val Pro Glu Ala Val
         1                   5                   10                  15
         Ala Glu Glu Val Ser Leu Phe Ser Thr Thr Asp Ile Val Leu Phe Ser
                            20                  25                  30
         Leu Ile Val Gly Val Leu Thr Tyr Trp Phe Ile Phe Lys Lys Lys Lys
                            35                  40                  45
         Glu Glu Ile Pro Glu Phe Ser Lys Ile Gln Thr Thr Ala Pro Pro Val
                  50                  55                  60
         Lys Glu Ser Ser Phe Val Glu Lys Met Lys Lys Thr Gly Arg Asn Ile
         65                  70                  75                  80
         Ile Val Phe Tyr Gly Ser Gln Thr Gly Thr Ala Glu Glu Phe Ala Asn
                            85                  90                  95
         Arg Leu Ser Lys Asp Ala His Arg Tyr Gly Met Arg Gly Met Ser Ala
                            100                 105                 110
         Asp Pro Glu Glu Tyr Asp Leu Ala Asp Leu Ser Ser Leu Pro Glu Ile
                  115                 120                 125
         Asp Lys Ser Leu Val Val Phe Cys Met Ala Thr Tyr Gly Glu Gly Asp
                  130                 135                 140
         Pro Thr Asp Asn Ala Gln Asp Phe Tyr Asp Trp Leu Gln Glu Thr Asp
         145                 150                 155                 160
         Val Asp Leu Thr Gly Val Lys Phe Ala Val Phe Gly Leu Gly Asn Lys
                            165                 170                 175
         Thr Tyr Glu His Phe Asn Ala Met Gly Lys Tyr Val Asp Gln Arg Leu
                            180                 185                 190
         Glu Gln Leu Gly Ala Gln Arg Ile Phe Glu Leu Gly Leu Gly Asp Asp
                  195                 200                 205
         Asp Gly Asn Leu Glu Glu Asp Phe Ile Thr Trp Arg Glu Gln Phe Trp
                  210                 215                 220
         Pro Ala Val Cys Glu Phe Phe Gly Val Glu Ala Thr Gly Glu Glu Ser
         225                 230                 235                 240
         Ser Ile Arg Gln Tyr Glu Leu Val Val His Glu Asp Met Asp Thr Ala
                            245                 250                 255
         Lys Val Tyr Thr Gly Glu Met Gly Arg Leu Lys Ser Tyr Glu Asn Gln
                            260                 265                 270
         Lys Pro Pro Phe Asp Ala Lys Asn Pro Phe Leu Ala Ala Val Thr Thr
                  275                 280                 285
         Asn Arg Lys Leu Asn Gln Gly Thr Glu Arg His Leu Met His Leu Glu
                  290                 295                 300
         Leu Asp Ile Ser Asp Ser Lys Ile Arg Tyr Glu Ser Gly Asp His Val
         305                 310                 315                 320
         Ala Val Tyr Pro Ala Asn Asp Ser Thr Leu Val Asn Gln Ile Gly Glu
```

```
                        325                 330                 335
        Ile Leu Gly Ala Asp Leu Asp Val Ile Met Ser Leu Asn Asn Leu Asp
                    340                 345                 350
        Glu Glu Ser Asn Lys Lys His Pro Phe Pro Cys Pro Thr Thr Tyr Arg
                355                 360                 365
        Thr Ala Leu Thr Tyr Tyr Leu Asp Ile Thr Asn Pro Pro Arg Thr Asn
            370                 375                 380
        Val Leu Tyr Glu Leu Ala Gln Tyr Ala Ser Glu Pro Ser Glu Gln Glu
        385                 390                 395                 400
        His Leu His Lys Met Ala Ser Ser Ser Gly Glu Gly Lys Glu Leu Tyr
                        405                 410                 415
        Leu Ser Trp Val Val Glu Ala Arg Arg His Ile Leu Ala Ile Leu Gln
                    420                 425                 430
        Asp Tyr Pro Ser Leu Arg Pro Pro Ile Asp His Leu Cys Glu Leu Leu
                435                 440                 445
        Pro Arg Leu Gln Ala Arg Tyr Tyr Ser Ile Ala Ser Ser Ser Lys Val
            450                 455                 460
        His Pro Asn Ser Val His Ile Cys Ala Val Ala Val Glu Tyr Glu Ala
        465                 470                 475                 480
        Lys Ser Gly Arg Val Asn Lys Gly Val Ala Thr Ser Trp Leu Arg Thr
                        485                 490                 495
        Lys Glu Pro Ala Gly Glu Asn Gly Arg Arg Ala Leu Val Pro Met Phe
                    500                 505                 510
        Val Arg Lys Ser Gln Phe Arg Leu Pro Phe Lys Pro Thr Thr Pro Val
                515                 520                 525
        Ile Met Val Gly Pro Gly Thr Gly Val Ala Pro Phe Met Gly Phe Ile
            530                 535                 540
        Gln Glu Arg Ala Trp Leu Arg Glu Gln Gly Lys Glu Val Gly Glu Thr
        545                 550                 555                 560
        Leu Leu Tyr Tyr Gly Cys Arg Arg Ser Asp Glu Asp Tyr Leu Tyr Arg
                        565                 570                 575
        Glu Glu Leu Ala Arg Phe His Lys Asp Gly Ala Leu Thr Gln Leu Asn
                    580                 585                 590
        Val Ala Phe Ser Arg Glu Gln Ala His Lys Val Tyr Val Gln His Leu
                595                 600                 605
        Leu Lys Arg Asp Lys Glu His Leu Trp Lys Leu Ile His Glu Gly Gly
            610                 615                 620
        Ala His Ile Tyr Val Cys Gly Asp Ala Arg Asn Met Ala Lys Asp Val
        625                 630                 635                 640
        Gln Asn Thr Phe Tyr Asp Ile Val Ala Glu Phe Gly Pro Met Glu His
                        645                 650                 655
        Thr Gln Ala Val Asp Tyr Val Lys Lys Leu Met Thr Lys Gly Arg Tyr
                    660                 665                 670
        Ser Leu Asp Val Trp Ser
                675
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<212> DNA
<213> baceriophage M13 reverse primer

<400> 40
caggaaacag ctatgac                                                  17


<210> 41
<211> 20
<212> DNA
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<213> bacteriophage T7 promoter primer

<400> 41
taatacgact cactataggg   20

<210> 42
<211> 30
<212> DNA
<213> Aspergillus ochraceus Primer 11alphaOH-for

<400> 42
gatcgaattc atgcccttct tcactgggct   30

<210> 43
<211> 37
<212> DNA
<213> Aspergillus ochraceus Primer 11alphaOH-rev

<400> 43
gatctctaga ttacacagtt aaactcgcca tatcgat   37

<210> 44
<211> 20
<212> DNA
<213> pFastBacI Primer Bacfwd

<400> 44
ctgttttcgt aacagttttg   20

<210> 45
<211> 19
<212> DNA
<213> pFastBacI Primer PolyA

<400> 45
cctctacaaa tgtggtatg   19

<210> 46
<211> 17
<212> DNA
<213> Aspergillus ochraceus Primer 45624-for1

<400> 46
gagatcaaga ttgcctt   17

<210> 47
<211> 15
<212> DNA
<213> Aspergillus ochraceus Primer 45624-for2

<400> 47
cttcgacgct ctcaa   15

<210> 48
<211> 17
<212> DNA
<213> Aspergillus ochraceus Primer 45624-rev1

<400> 48
gcaatcttga tctcgtt   17

5   <210> 49
<211> 2403
<212> DNA
<213> human oxidoreductase partial S90469

10   <400> 49
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ctttttcagca tgacggacat gattctgttt tcgctcatcg tgggtctcct aacctactgg   120
ttcctcttca gaaagaaaaa agaagaagtc cccgagttca ccaaaaattca gacattgacc   180
tcctctgtca gagagagcag ctttgtggaa aagatgaaga aaacggggag gaacatcatc   240

15   gtgttctacg gctcccagac ggggactgca gaggagtttg ccaaccgcct gtccaaggac   300
gcccaccgct acgggatgcg aggcatgtca gcggaccctg aggagtatga cctggccgac   360
ctgagcagcc tgccagagat cgacaacgcc ctggtggttt tctgcatggc cacctacggt   420
gagggagacc ccaccgacaa tgcccaggac ttctacgact ggctgcagga gacagacgtg   480
gatctctctg gggtcaagtt cgcggtgttt ggtcttggga caagaccta cgagcacttc   540

20   aatgccatgg gcaagtacgt ggacaagcgg ctggagcagc tcggcgccca gcgcatcttt   600
gagctggggt tgggcgacga cgatgggaac ttggaggagg acttcatcac ctggcgagag   660
cagttctggc cggccgtgtg tgaacacttt ggggtggaag ccactggcga ggagtccagc   720
attcgccagt acgagcttgt ggtccacacc gacatagatg cggccaaggt gtacatgggg   780
gagatgggcc ggctgaagag ctacgagaac cagaagcccc cctttgatgc caagaatccg   840

25   ttcctggctg cagtcaccac caaccggaag ctgaaccagg aaccgagcg ccacctcatg   900
cacctggaat tggacatctc ggactccaaa atcaggtatg aatctgggga ccacgtggct   960
gtgtacccag ccaacgactc tgctctcgtc aaccagctgg gcaaaatcct gggtgccgac 1020
ctggacgtcg tcatgtccct gaacaacctg gatgaggagt ccaacaagaa gcacccattc 1080
ccgtgcccta cgtcctaccg cacggccctc acctactacc tggacatcac caacccgccg 1140

30   cgtaccaacg tgctgtacga gctggcgcag tacgcctcgg agccctcgga gcaggagctg 1200
ctgcgcaaga tggcctcctc ctccggcgag ggcaaggagc tgtacctgag ctgggtggtg 1260
gaggcccgga ggcacatcct ggccatcctg caggactgcc cgtccctgcg gccccccatc 1320
gaccacctgt gtgagctgct gccgcgcctg caggcccgct actactccat cgcctcatcc 1380
tccaaggtcc accccaactc tgtgcacatc tgtgcggtgg ttgtggagta cgagaccaag 1440

35   gccggccgca tcaacaaggg cgtggccacc aactggctgc gggccaagga gcctgtcggg 1500
gagaacgcg gccgtgcgct ggtgcccatg ttcgtgcgca gtcccagtt acgcctgccc 1560
ttcaaggcca ccacgcctgt catcatggtg gcccccggca ccgggtggca cccttcata 1620
ggcttcatcc aggagcgggc ctggctgcga cagcaggca aggaggtggg ggagacgctg 1680
ctgtactacg gctgccgccg ctcggatgag gactacctgt accgggagga gctggcgcag 1740

40   ttccacaggg acggtgcgct cacccagctc aacgtggcct tctcccggga gcagtcccac 1800
aaggtctacg tccagcacct gctaaagcaa gaccgagagc acctgtggaa gttgatcgaa 1860
ggcggtgccc acatctacgt ctgtgggat gcacggaaca tggccaggga tgtgcagaac 1920
accttctacg acatcgtggc tgagctcggg gccatggagc acgcgcaggc ggtggactac 1980
atcaagaaac tgatgaccaa gggccgctac tccctggacg tgtggagcta ggggcctgcc 2040

45   tgccccaccc accccacaga ctccggcctg taatcagctc tcctggctcc ctcccgtagt 2100
ctcctgggtg tgtttggctt ggccttggca tgggcgcagg cccagtgaca aagactcctc 2160
tgggcctggg gtgcatcctc ctcagcccc aggccaggtg aggtccaccg gccctggca 2220
gcacagccca gggcctgcat ggggcaccg ggctccatgc ctctggagcc tctggcctc 2280
ggtggctgca cagaagggct ctttctctct gctgagctgg cccagcccct ccacgtgatt 2340

50   tccagtgagt gtaaataatt ttaaataacc tctggccctt ggaataaagt tctgtttct 2400
gta   2403

         <210> 50
<211> 676
55   <212> PRT
<213> human cytochrome P450 reductase, partial AAB21814

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<400> 50
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1               5                   10                  15
Glu Glu Val Ser Leu Phe Ser Met Thr Asp Met Ile Leu Phe Ser Leu
                20                  25                  30
Ile Val Gly Leu Leu Thr Tyr Trp Phe Leu Phe Arg Lys Lys Lys Glu
        35                  40                  45
Glu Val Pro Glu Phe Thr Lys Ile Gln Thr Leu Thr Ser Ser Val Arg
        50                  55                  60
Glu Ser Ser Phe Val Glu Lys Met Lys Lys Thr Gly Arg Asn Ile Ile
65                  70                  75                  80
Val Phe Tyr Gly Ser Gln Thr Gly Thr Ala Glu Glu Phe Ala Asn Arg
                85                  90                  95
Leu Ser Lys Asp Ala His Arg Tyr Gly Met Arg Gly Met Ser Ala Asp
                100                 105                 110
Pro Glu Glu Tyr Asp Leu Ala Asp Leu Ser Ser Leu Pro Glu Ile Asp
                115                 120                 125
Asn Ala Leu Val Val Phe Cys Met Ala Thr Tyr Gly Glu Gly Asp Pro
                130                 135                 140
Thr Asp Asn Ala Gln Asp Phe Tyr Asp Trp Leu Gln Glu Thr Asp Val
145                 150                 155                 160
Asp Leu Ser Gly Val Lys Phe Ala Val Phe Gly Leu Gly Asn Lys Thr
                165                 170                 175
Tyr Glu His Phe Asn Ala Met Gly Lys Tyr Val Asp Lys Arg Leu Glu
                180                 185                 190
Gln Leu Gly Ala Gln Arg Ile Phe Glu Leu Gly Leu Gly Asp Asp Asp
                195                 200                 205
Gly Asn Leu Glu Glu Asp Phe Ile Thr Trp Arg Glu Gln Phe Trp Pro
                210                 215                 220
Ala Val Cys Glu His Phe Gly Val Glu Ala Thr Gly Glu Glu Ser Ser
225                 230                 235                 240
Ile Arg Gln Tyr Glu Leu Val Val His Thr Asp Ile Asp Ala Ala Lys
                245                 250                 255
Val Tyr Met Gly Glu Met Gly Arg Leu Lys Ser Tyr Glu Asn Gln Lys
                260                 265                 270
Pro Pro Phe Asp Ala Lys Asn Pro Phe Leu Ala Ala Val Thr Thr Asn
                275                 280                 285
Arg Lys Leu Asn Gln Gly Thr Glu Arg His Leu Met His Leu Glu Leu
                290                 295                 300
Asp Ile Ser Asp Ser Lys Ile Arg Tyr Glu Ser Gly Asp His Val Ala
305                 310                 315                 320
Val Tyr Pro Ala Asn Asp Ser Ala Leu Val Asn Gln Leu Gly Lys Ile
                325                 330                 335
Leu Gly Ala Asp Leu Asp Val Val Met Ser Leu Asn Asn Leu Asp Glu
                340                 345                 350
Glu Ser Asn Lys Lys His Pro Phe Pro Cys Pro Thr Ser Tyr Arg Thr
                355                 360                 365
Ala Leu Thr Tyr Tyr Leu Asp Ile Thr Asn Pro Pro Arg Thr Asn Val
                370                 375                 380
Leu Tyr Glu Leu Ala Gln Tyr Ala Ser Glu Pro Ser Glu Gln Glu Leu
385                 390                 395                 400
Leu Arg Lys Met Ala Ser Ser Ser Gly Glu Gly Lys Glu Leu Tyr Leu
                405                 410                 415
Ser Trp Val Val Glu Ala Arg Arg His Ile Leu Ala Ile Leu Gln Asp
                420                 425                 430
Cys Pro Ser Leu Arg Pro Pro Ile Asp His Leu Cys Glu Leu Leu Pro
                435                 440                 445
```

```
Arg Leu Gln Ala Arg Tyr Tyr Ser Ile Ala Ser Ser Ser Lys Val His
    450                 455             460
Pro Asn Ser Val His Ile Cys Ala Val Val Val Glu Tyr Glu Thr Lys
465                 470             475                 480
Ala Gly Arg Ile Asn Lys Gly Val Ala Thr Asn Trp Leu Arg Ala Lys
                485             490                 495
Glu Pro Val Gly Glu Asn Gly Gly Arg Ala Leu Val Pro Met Phe Val
                500             505             510
Arg Lys Ser Gln Leu Arg Leu Pro Phe Lys Ala Thr Thr Pro Val Ile
            515             520             525
Met Val Gly Pro Gly Thr Gly Trp His Pro Phe Ile Gly Phe Ile Gln
    530             535             540
Glu Arg Ala Trp Leu Arg Gln Gln Gly Lys Glu Val Gly Glu Thr Leu
545             550             555                 560
Leu Tyr Tyr Gly Cys Arg Arg Ser Asp Glu Asp Tyr Leu Tyr Arg Glu
                565             570             575
Glu Leu Ala Gln Phe His Arg Asp Gly Ala Leu Thr Gln Leu Asn Val
            580             585             590
Ala Phe Ser Arg Glu Gln Ser His Lys Val Tyr Val Gln His Leu Leu
            595             600             605
Lys Gln Asp Arg Glu His Leu Trp Lys Leu Ile Glu Gly Gly Ala His
    610             615             620
Ile Tyr Val Cys Gly Asp Ala Arg Asn Met Ala Arg Asp Val Gln Asn
625             630             635                 640
Thr Phe Tyr Asp Ile Val Ala Glu Leu Gly Ala Met Glu His Ala Gln
            645             650             655
Ala Val Asp Tyr Ile Lys Lys Leu Met Thr Lys Gly Arg Tyr Ser Leu
            660             665             670
Asp Val Trp Ser
        675
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<211> 677
<212> PRT
<213> human NADPH-ferrihemoprotein reductase A60557


<400> 51
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1               5               10              15
Ala Glu Glu Val Ser Leu Phe Ser Met Thr Asp Met Ile Leu Phe Ser
            20              25              30
Leu Ile Val Gly Leu Leu Thr Tyr Trp Phe Leu Phe Arg Lys Lys Lys
        35              40              45
Glu Glu Val Pro Glu Phe Thr Lys Ile Gln Thr Leu Thr Ser Ser Val
    50              55              60
Arg Glu Ser Ser Phe Val Glu Lys Met Lys Lys Thr Gly Arg Asn Ile
65              70              75              80
Ile Val Phe Tyr Gly Ser Gln Thr Gly Thr Ala Glu Glu Phe Ala Asn
            85              90              95
Arg Leu Ser Lys Asp Ala His Arg Tyr Gly Met Arg Gly Met Ser Ala
        100             105             110
Asp Pro Glu Glu Tyr Asp Leu Ala Asp Leu Ser Ser Leu Pro Glu Ile
        115             120             125
Asp Asn Ala Leu Val Val Phe Cys Met Ala Thr Tyr Gly Glu Gly Asp
    130             135             140
Pro Thr Asp Asn Ala Gln Asp Phe Tyr Asp Trp Leu Gln Glu Thr Asp
145             150             155             160
```

Val Asp Leu Ser Gly Val Lys Phe Ala Val Phe Gly Leu Gly Asn Lys
                    165   170   175

Thr Tyr Glu His Phe Asn Ala Met Gly Lys Tyr Val Asp Lys Arg Leu
                    180   185   190

Glu Gln Leu Gly Ala Gln Arg Ile Phe Glu Leu Gly Leu Gly Asp Asp
                    195   200   205

Asp Gly Asn Leu Glu Glu Asp Phe Ile Thr Trp Arg Glu Gln Phe Trp
        210   215   220

Pro Ala Val Cys Glu His Phe Gly Val Glu Ala Thr Gly Glu Glu Ser
225   230   235   240

Ser Ile Arg Gln Tyr Glu Leu Val Val His Thr Asp Ile Asp Ala Ala
                    245   250   255

Lys Val Tyr Met Gly Glu Met Gly Arg Leu Lys Ser Tyr Glu Asn Gln
                    260   265   270

Lys Pro Pro Phe Asp Ala Lys Asn Pro Phe Leu Ala Ala Val Thr Thr
                    275   280   285

Asn Arg Lys Leu Asn Gln Gly Thr Glu Arg His Leu Met His Leu Glu
        290   295   300

Leu Asp Ile Ser Asp Ser Lys Ile Arg Tyr Glu Ser Gly Asp His Val
305   310   315   320

Ala Val Tyr Pro Ala Asn Asp Ser Ala Leu Val Asn Gln Leu Gly Lys
                    325   330   335

Ile Leu Gly Ala Asp Leu Asp Val Val Met Ser Leu Asn Asn Leu Asp
                    340   345   350

Glu Glu Ser Asn Lys Lys His Pro Phe Pro Cys Pro Thr Ser Tyr Arg
        355   360   365

Thr Ala Leu Thr Tyr Tyr Leu Asp Ile Thr Asn Pro Pro Arg Thr Asn
        370   375   380

Val Leu Tyr Glu Leu Ala Gln Tyr Ala Ser Glu Pro Ser Glu Gln Glu
385   390   395   400

Leu Leu Arg Lys Met Ala Ser Ser Ser Gly Glu Gly Lys Glu Leu Tyr
                    405   410   415

Leu Ser Trp Val Val Glu Ala Arg Arg His Ile Leu Ala Ile Leu Gln
                    420   425   430

Asp Cys Pro Ser Leu Arg Pro Pro Ile Asp His Leu Cys Glu Leu Leu
        435   440   445

Pro Arg Leu Gln Ala Arg Tyr Tyr Ser Ile Ala Ser Ser Ser Lys Val
        450   455   460

His Pro Asn Ser Val His Ile Cys Ala Val Val Val Glu Tyr Glu Thr
465   470   475   480

Lys Ala Gly Arg Ile Asn Lys Gly Val Ala Thr Asn Trp Leu Arg Ala
                    485   490   495

Lys Glu Pro Ala Gly Glu Asn Gly Gly Arg Ala Leu Val Pro Met Phe
                    500   505   510

Val Arg Lys Ser Gln Phe Arg Leu Pro Phe Lys Ala Thr Thr Pro Val
        515   520   525

Ile Met Val Gly Pro Gly Thr Gly Val Ala Pro Phe Ile Gly Phe Ile
        530   535   540

Gln Glu Arg Ala Trp Leu Arg Gln Gln Gly Lys Glu Val Gly Glu Thr
545   550   555   560

Leu Leu Tyr Tyr Gly Cys Arg Arg Ser Asp Glu Asp Tyr Leu Tyr Arg
                    565   570   575

Glu Glu Leu Ala Gln Phe His Arg Asp Gly Ala Leu Thr Gln Leu Asn
                    580   585   590

Val Ala Phe Ser Arg Glu Gln Ser His Lys Val Tyr Val Gln His Leu
                    595   600   605

Leu Lys Gln Asp Arg Glu His Leu Trp Lys Leu Ile Glu Gly Gly Ala

```
            610                615                620
His Ile Tyr Val Cys Gly Asp Ala Arg Asn Met Ala Arg Asp Val Gln
625                630                635                640
Asn Thr Phe Tyr Asp Ile Val Ala Glu Leu Gly Ala Met Glu His Ala
                645                650                655
Gln Ala Val Asp Tyr Ile Lys Lys Leu Met Thr Lys Gly Arg Tyr Ser
                660                665                670
Leu Asp Val Trp Ser
            675
```

```
<210> 52
<211> 677
<212> PRT
<213> human NADPH-CYTOCHROME P450 REDUCTASE P16435

<400> 52
Met Gly Asp Ser His Val Asp Thr Ser Ser Thr Val Ser Glu Ala Val
1                5                10                15
Ala Glu Glu Val Ser Leu Phe Ser Met Thr Asp Met Ile Leu Phe Ser
                20                25                30
Leu Ile Val Gly Leu Leu Thr Tyr Trp Phe Leu Phe Arg Lys Lys Lys
            35                40                45
Glu Glu Val Pro Glu Phe Thr Lys Ile Gln Thr Leu Thr Ser Ser Val
        50                55                60
Arg Glu Ser Ser Phe Val Glu Lys Met Lys Lys Thr Gly Arg Asn Ile
65                70                75                80
Ile Val Phe Tyr Gly Ser Gln Thr Gly Thr Ala Glu Glu Phe Ala Asn
                85                90                95
Arg Leu Ser Lys Asp Ala His Arg Tyr Gly Met Arg Gly Met Ser Ala
            100                105                110
Asp Pro Glu Glu Tyr Asp Leu Ala Asp Leu Ser Ser Leu Pro Glu Ile
        115                120                125
Asp Asn Ala Leu Val Val Phe Cys Met Ala Thr Tyr Gly Glu Gly Asp
        130                135                140
Pro Thr Asp Asn Ala Gln Asp Phe Tyr Asp Trp Leu Gln Glu Thr Asp
145                150                155                160
Val Asp Leu Ser Gly Val Lys Phe Ala Val Phe Gly Leu Gly Asn Lys
            165                170                175
Thr Tyr Glu His Phe Asn Ala Met Gly Lys Tyr Val Asp Lys Arg Leu
            180                185                190
Glu Gln Leu Gly Ala Gln Arg Ile Phe Glu Leu Gly Leu Gly Asp Asp
        195                200                205
Asp Gly Asn Leu Glu Glu Asp Phe Ile Thr Trp Arg Glu Gln Phe Trp
        210                215                220
Pro Ala Val Cys Glu His Phe Gly Val Glu Ala Thr Gly Glu Glu Ser
225                230                235                240
Ser Ile Arg Gln Tyr Glu Leu Val Val His Thr Asp Ile Asp Ala Ala
            245                250                255
Lys Val Tyr Met Gly Glu Met Gly Arg Leu Lys Ser Tyr Glu Asn Gln
            260                265                270
Lys Pro Pro Phe Asp Ala Lys Asn Pro Phe Leu Ala Ala Val Thr Thr
        275                280                285
Asn Arg Lys Leu Asn Gln Gly Thr Glu Arg His Leu Met His Leu Glu
        290                295                300
Leu Asp Ile Ser Asp Ser Lys Ile Arg Tyr Glu Ser Gly Asp His Val
305                310                315                320
Ala Val Tyr Pro Ala Asn Asp Ser Ala Leu Val Asn Gln Leu Gly Lys
```

```
                         325                    330                    335
       Ile Leu Gly Ala Asp Leu Asp Val Val Met Ser Leu Asn Asn Leu Asp
                     340                    345                    350
       Glu Glu Ser Asn Lys Lys His Pro Phe Pro Cys Pro Thr Ser Tyr Arg
                     355                    360                    365
       Thr Ala Leu Thr Tyr Tyr Leu Asp Ile Thr Asn Pro Pro Arg Thr Asn
                     370                    375                    380
       Val Leu Tyr Glu Leu Ala Gln Tyr Ala Ser Glu Pro Ser Glu Gln Glu
       385                    390                    395                    400
       Leu Leu Arg Lys Met Ala Ser Ser Ser Gly Glu Gly Lys Glu Leu Tyr
                         405                    410                    415
       Leu Ser Trp Val Val Glu Ala Arg Arg His Ile Leu Ala Ile Leu Gln
                     420                    425                    430
       Asp Cys Pro Ser Leu Arg Pro Pro Ile Asp His Leu Cys Glu Leu Leu
                     435                    440                    445
       Pro Arg Leu Gln Ala Arg Tyr Tyr Ser Ile Ala Ser Ser Ser Lys Val
                     450                    455                    460
       His Pro Asn Ser Val His Ile Cys Ala Val Val Val Glu Tyr Glu Thr
       465                    470                    475                    480
       Lys Ala Gly Arg Ile Asn Lys Gly Val Ala Thr Asn Trp Leu Arg Ala
                         485                    490                    495
       Lys Glu Pro Ala Gly Glu Asn Gly Gly Arg Ala Leu Val Pro Met Phe
                     500                    505                    510
       Val Arg Lys Ser Gln Phe Arg Leu Pro Phe Lys Ala Thr Thr Pro Val
                     515                    520                    525
       Ile Met Val Gly Pro Gly Thr Gly Val Ala Pro Phe Ile Gly Phe Ile
                     530                    535                    540
       Gln Glu Arg Ala Trp Leu Arg Gln Gln Gly Lys Glu Val Gly Glu Thr
       545                    550                    555                    560
       Leu Leu Tyr Tyr Gly Cys Arg Arg Ser Asp Glu Asp Tyr Leu Tyr Arg
                         565                    570                    575
       Glu Glu Leu Ala Gln Phe His Arg Asp Gly Ala Leu Thr Gln Leu Asn
                     580                    585                    590
       Val Ala Phe Ser Arg Glu Gln Ser His Lys Val Tyr Val Gln His Leu
                     595                    600                    605
       Leu Lys Gln Asp Arg Glu His Leu Trp Lys Leu Ile Glu Gly Gly Ala
                     610                    615                    620
       His Ile Tyr Val Cys Gly Asp Ala Arg Asn Met Ala Arg Asp Val Gln
       625                    630                    635                    640
       Asn Thr Phe Tyr Asp Ile Val Ala Glu Leu Gly Ala Met Glu His Ala
                         645                    650                    655
       Gln Ala Val Asp Tyr Ile Lys Lys Leu Met Thr Lys Gly Arg Tyr Ser
                     660                    665                    670
       Leu Asp Val Trp Ser
               675


       <210> 53
       <211> 679
       <212> PRT
       <213> Rabbit NADPH-CYTOCHROME P450 REDUCTASE P00389


       <400> 53
       Met Ala Asp Ser His Gly Asp Thr Gly Ala Thr Met Pro Glu Ala Ala
       1                   5                   10                  15
       Ala Gln Glu Ala Ser Val Phe Ser Met Thr Asp Val Val Leu Phe Ser
                           20                  25                  30
       Leu Ile Val Gly Leu Ile Thr Tyr Trp Phe Leu Phe Arg Lys Lys Lys
```

```
                35                    40                    45
      Glu Glu Val Pro Glu Phe Thr Lys Ile Gln Ala Pro Thr Ser Ser Ser
            50                    55                    60
      Val Lys Glu Ser Ser Phe Val Glu Lys Met Lys Lys Thr Gly Arg Asn
      65                    70                    75                    80
      Ile Val Val Phe Tyr Gly Ser Gln Thr Gly Thr Ala Glu Glu Phe Ala
                      85                    90                    95
      Asn Arg Leu Ser Lys Asp Ala His Arg Tyr Gly Met Arg Gly Met Ala
                  100                   105                   110
      Ala Asp Pro Glu Glu Tyr Asp Leu Ala Asp Leu Ser Ser Leu Pro Glu
                  115                   120                   125
      Ile Asn Asn Ala Leu Ala Val Phe Cys Met Ala Thr Tyr Gly Glu Gly
            130                   135                   140
      Asp Pro Thr Asp Asn Ala Gln Asp Phe Tyr Asp Trp Leu Gln Glu Thr
      145                   150                   155                   160
      Asp Val Asp Leu Ser Gly Val Lys Tyr Ala Val Phe Gly Leu Gly Asn
                      165                   170                   175
      Lys Thr Tyr Glu His Phe Asn Ala Met Gly Lys Tyr Val Asp Gln Arg
                  180                   185                   190
      Leu Glu Gln Leu Gly Ala Gln Arg Ile Phe Glu Leu Gly Met Gly Asp
                  195                   200                   205
      Asp Asp Ala Asn Leu Glu Glu Asp Phe Ile Thr Trp Arg Glu Gln Phe
            210                   215                   220
      Trp Pro Ala Val Cys Glu His Phe Gly Val Glu Ala Thr Gly Glu Glu
      225                   230                   235                   240
      Ser Ser Ile Arg Gln Tyr Glu Leu Val Leu His Thr Asp Ile Asp Val
                      245                   250                   255
      Ala Lys Val Tyr Gln Gly Glu Met Gly Arg Leu Lys Ser Tyr Glu Asn
                  260                   265                   270
      Gln Lys Pro Pro Phe Asp Ala Lys Asn Pro Phe Leu Ala Thr Val Thr
                  275                   280                   285
      Thr Asn Arg Lys Leu Asn Gln Gly Thr Glu Arg His Leu Met His Leu
            290                   295                   300
      Glu Leu Asp Ile Ser Asp Ser Lys Ile Arg Tyr Glu Ser Gly Asp His
      305                   310                   315                   320
      Val Ala Val Tyr Pro Ala Asn Asp Ser Ala Leu Val Asn Gln Leu Gly
                      325                   330                   335
      Glu Ile Leu Gly Ala Asp Leu Asp Val Val Met Ser Leu Asn Asn Leu
                  340                   345                   350
      Asp Glu Glu Ser Asn Lys Lys His Pro Phe Pro Cys Pro Thr Ser Tyr
            355                   360                   365
      Arg Thr Ala Leu Thr Tyr Tyr Leu Asp Ile Thr Asn Pro Pro Arg Thr
            370                   375                   380
      Asn Val Leu Tyr Glu Leu Ala Gln Tyr Ala Ala Asp Pro Ala Glu Gln
      385                   390                   395                   400
      Glu Gln Leu Arg Lys Met Ala Ser Ser Ser Gly Glu Gly Lys Glu Leu
                  405                   410                   415
      Tyr Leu Ser Trp Val Val Glu Ala Arg Arg His Ile Leu Ala Ile Leu
                  420                   425                   430
      Gln Asp Tyr Pro Ser Leu Arg Pro Pro Ile Asp His Leu Cys Glu Leu
            435                   440                   445
      Leu Pro Arg Leu Gln Ala Arg Tyr Tyr Ser Ile Ala Ser Ser Ser Lys
            450                   455                   460
      Val His Pro Asn Ser Val His Ile Cys Ala Val Ala Val Glu Tyr Glu
      465                   470                   475                   480
      Thr Lys Ala Gly Arg Leu Asn Lys Gly Val Ala Thr Ser Trp Leu Arg
                      485                   490                   495
```

```
Ala Lys Glu Pro Ala Gly Glu Asn Gly Gly Arg Ala Leu Val Pro Met
            500                 505                 510
Phe Val Arg Lys Ser Gln Phe Arg Leu Pro Phe Lys Ala Thr Thr Pro
            515                 520                 525
Val Ile Met Val Gly Pro Gly Thr Gly Val Ala Pro Phe Ile Gly Phe
            530                 535                 540
Ile Gln Glu Arg Ala Trp Leu Arg Gln Gln Gly Lys Glu Val Gly Glu
545                 550                 555                 560
Thr Leu Leu Tyr Tyr Gly Cys Arg Arg Ala Ala Glu Asp Tyr Leu Tyr
                565                 570                 575
Arg Glu Glu Leu Ala Gly Phe Gln Lys Asp Gly Thr Leu Ser Gln Leu
            580                 585                 590
Asn Val Ala Phe Ser Arg Glu Gln Ala Gln Lys Val Tyr Val Gln His
            595                 600                 605
Leu Leu Arg Arg Asp Lys Glu His Leu Trp Arg Leu Ile His Glu Gly
            610                 615                 620
Gly Ala His Ile Tyr Val Cys Gly Asp Ala Arg Asn Met Ala Arg Asp
625                 630                 635                 640
Val Gln Asn Thr Phe Tyr Asp Ile Val Ala Glu Leu Gly Ala Met Glu
                645                 650                 655
His Ala Gln Ala Val Asp Tyr Val Lys Lys Leu Met Thr Lys Gly Arg
                660                 665                 670
Tyr Ser Leu Asp Val Trp Ser
            675
```

```
<210> 54
<211> 678
<212> PRT
<213> Rat NADPH-CYTOCHROME P450 REDUCTASE P00388

<400> 54
Met Gly Asp Ser His Glu Asp Thr Ser Ala Thr Met Pro Glu Ala Val
1                   5                   10                  15
Ala Glu Glu Val Ser Leu Phe Ser Thr Thr Asp Met Val Leu Phe Ser
            20                  25                  30
Leu Ile Val Gly Val Leu Thr Tyr Trp Phe Ile Phe Arg Lys Lys Lys
            35                  40                  45
Glu Glu Ile Pro Glu Phe Ser Lys Ile Gln Thr Thr Ala Pro Pro Val
            50                  55                  60
Lys Glu Ser Ser Phe Val Glu Lys Met Lys Lys Thr Gly Arg Asn Ile
65                  70                  75                  80
Ile Val Phe Tyr Gly Ser Gln Thr Gly Thr Ala Glu Glu Phe Ala Asn
                85                  90                  95
Arg Leu Ser Lys Asp Ala His Arg Tyr Gly Met Arg Gly Met Ser Ala
            100                 105                 110
Asp Pro Glu Glu Tyr Asp Leu Ala Asp Leu Ser Ser Leu Pro Glu Ile
            115                 120                 125
Asp Lys Ser Leu Val Val Phe Cys Met Ala Thr Tyr Gly Glu Gly Asp
            130                 135                 140
Pro Thr Asp Asn Ala Gln Asp Phe Tyr Asp Trp Leu Gln Glu Thr Asp
145                 150                 155                 160
Val Asp Leu Thr Gly Val Lys Phe Ala Val Phe Gly Leu Gly Asn Lys
                165                 170                 175
Thr Tyr Glu His Phe Asn Ala Met Gly Lys Tyr Val Asp Gln Arg Leu
                180                 185                 190
Glu Gln Leu Gly Ala Gln Arg Ile Phe Glu Leu Gly Leu Gly Asp Asp
            195                 200                 205
```

Asp Gly Asn Leu Glu Glu Asp Phe Ile Thr Trp Arg Glu Gln Phe Trp
   210   215   220

Pro Ala Val Cys Glu Phe Phe Gly Val Glu Ala Thr Gly Glu Glu Ser
225   230   235   240

Ser Ile Arg Gln Tyr Glu Leu Val Val His Glu Asp Met Asp Val Ala
       245   250   255

Lys Val Tyr Thr Gly Glu Met Gly Arg Leu Lys Ser Tyr Glu Asn Gln
       260   265   270

Lys Pro Pro Phe Asp Ala Lys Asn Pro Phe Leu Ala Ala Val Thr Ala
       275   280   285

Asn Arg Lys Leu Asn Gln Gly Thr Glu Arg His Leu Met His Leu Glu
       290   295   300

Leu Asp Ile Ser Asp Ser Lys Ile Arg Tyr Glu Ser Gly Asp His Val
305   310   315   320

Ala Val Tyr Pro Ala Asn Asp Ser Ala Leu Val Asn Gln Ile Gly Glu
       325   330   335

Ile Leu Gly Ala Asp Leu Asp Val Ile Met Ser Leu Asn Asn Leu Asp
       340   345   350

Glu Glu Ser Asn Lys Lys His Pro Phe Pro Cys Pro Thr Thr Tyr Arg
       355   360   365

Thr Ala Leu Thr Tyr Tyr Leu Asp Ile Thr Asn Pro Pro Arg Thr Asn
       370   375   380

Val Leu Tyr Glu Leu Ala Gln Tyr Ala Ser Glu Pro Ser Glu Gln Glu
385   390   395   400

His Leu His Lys Met Ala Ser Ser Ser Gly Glu Gly Lys Glu Leu Tyr
          405   410   415

Leu Ser Trp Val Val Glu Ala Arg Arg His Ile Leu Ala Ile Leu Gln
          420   425   430

Asp Tyr Pro Ser Leu Arg Pro Pro Ile Asp His Leu Cys Glu Leu Leu
          435   440   445

Pro Arg Leu Gln Ala Arg Tyr Tyr Ser Ile Ala Ser Ser Ser Lys Val
       450   455   460

His Pro Asn Ser Val His Ile Cys Ala Val Ala Val Glu Tyr Glu Ala
465   470   475   480

Lys Ser Gly Arg Val Asn Lys Gly Val Ala Thr Ser Trp Leu Arg Ala
          485   490   495

Lys Glu Pro Ala Gly Glu Asn Gly Gly Arg Ala Leu Val Pro Met Phe
          500   505   510

Val Arg Lys Ser Gln Phe Arg Leu Pro Phe Lys Ser Thr Thr Pro Val
       515   520   525

Ile Met Val Gly Pro Gly Thr Gly Ile Ala Pro Phe Met Gly Phe Ile
       530   535   540

Gln Glu Arg Ala Trp Leu Arg Glu Gln Gly Lys Glu Val Gly Glu Thr
545   550   555   560

Leu Leu Tyr Tyr Gly Cys Arg Arg Ser Asp Glu Asp Tyr Leu Tyr Arg
       565   570   575

Glu Glu Leu Ala Arg Phe His Lys Asp Gly Ala Leu Thr Gln Leu Asn
       580   585   590

Val Ala Phe Ser Arg Glu Gln Ala His Lys Val Tyr Val Gln His Leu
       595   600   605

Leu Lys Arg Asp Arg Glu His Leu Trp Lys Leu Ile His Glu Gly Gly
       610   615   620

Ala His Ile Tyr Val Cys Gly Asp Ala Arg Asn Met Ala Lys Asp Val
625   630   635   640

Gln Asn Thr Phe Tyr Asp Ile Val Ala Glu Phe Gly Pro Met Glu His
          645   650   655

Thr Gln Ala Val Asp Tyr Val Lys Lys Leu Met Thr Lys Gly Arg Tyr

```
                            660                   665                    670
          Ser Leu Asp Val Trp Ser
                  675


    <210> 55
    <211> 678
    <212> PRT
    <213> Mouse NADPH-CYTOCHROME P450 REDUCTASE P37040


    <400> 55
          Met Gly Asp Ser His Glu Asp Thr Ser Ala Thr Val Pro Glu Ala Val
          1               5                   10                  15
          Ala Glu Glu Val Ser Leu Phe Ser Thr Thr Asp Ile Val Leu Phe Ser
                      20                  25                  30
          Leu Ile Val Gly Val Leu Thr Tyr Trp Phe Ile Phe Lys Lys Lys Lys
                  35                  40                  45
          Glu Glu Ile Pro Glu Phe Ser Lys Ile Gln Thr Thr Ala Pro Pro Val
                  50                  55                  60
          Lys Glu Ser Ser Phe Val Glu Lys Met Lys Lys Thr Gly Arg Asn Ile
          65                  70                  75                  80
          Ile Val Phe Tyr Gly Ser Gln Thr Gly Thr Ala Glu Glu Phe Ala Asn
                          85                  90                  95
          Arg Leu Ser Lys Asp Ala His Arg Tyr Gly Met Arg Gly Met Ser Ala
                      100                 105                 110
          Asp Pro Glu Glu Tyr Asp Leu Ala Asp Leu Ser Ser Leu Pro Glu Ile
                      115                 120                 125
          Asp Lys Ser Leu Val Val Phe Cys Met Ala Thr Tyr Gly Glu Gly Asp
                  130                 135                 140
          Pro Thr Asp Asn Ala Gln Asp Phe Tyr Asp Trp Leu Gln Glu Thr Asp
          145                 150                 155                 160
          Val Asp Leu Thr Gly Val Lys Phe Ala Val Phe Gly Leu Gly Asn Lys
                      165                 170                 175
          Thr Tyr Glu His Phe Asn Ala Met Gly Lys Tyr Val Asp Gln Arg Leu
                      180                 185                 190
          Glu Gln Leu Gly Ala Gln Arg Ile Phe Glu Leu Gly Leu Gly Asp Asp
                      195                 200                 205
          Asp Gly Asn Leu Glu Glu Asp Phe Ile Thr Trp Arg Glu Gln Phe Trp
                  210                 215                 220
          Pro Ala Val Cys Glu Phe Phe Gly Val Glu Ala Thr Gly Glu Glu Ser
          225                 230                 235                 240
          Ser Ile Arg Gln Tyr Glu Leu Val Val His Glu Asp Met Asp Thr Ala
                      245                 250                 255
          Lys Val Tyr Thr Gly Glu Met Gly Arg Leu Lys Ser Tyr Glu Asn Gln
                      260                 265                 270
          Lys Pro Pro Phe Asp Ala Lys Asn Pro Phe Leu Ala Ala Val Thr Thr
                  275                 280                 285
          Asn Arg Lys Leu Asn Gln Gly Thr Glu Arg His Leu Met His Leu Glu
                  290                 295                 300
          Leu Asp Ile Ser Asp Ser Lys Ile Arg Tyr Glu Ser Gly Asp His Val
          305                 310                 315                 320
          Ala Val Tyr Pro Ala Asn Asp Ser Thr Leu Val Asn Gln Ile Gly Glu
                      325                 330                 335
          Ile Leu Gly Ala Asp Leu Asp Val Ile Met Ser Leu Asn Asn Leu Asp
                  340                 345                 350
          Glu Glu Ser Asn Lys Lys His Pro Phe Pro Cys Pro Thr Thr Tyr Arg
                  355                 360                 365
          Thr Ala Leu Thr Tyr Tyr Leu Asp Ile Thr Asn Pro Pro Arg Thr Asn
```

```
            370                375                380
    Val Leu Tyr Glu Leu Ala Gln Tyr Ala Ser Glu Pro Ser Glu Gln Glu
    385                390                395                400
    His Leu His Lys Met Ala Ser Ser Ser Gly Glu Gly Lys Glu Leu Tyr
                    405                410                415
    Leu Ser Trp Val Val Glu Ala Arg Arg His Ile Leu Ala Ile Leu Gln
                    420                425                430
    Asp Tyr Pro Ser Leu Arg Pro Pro Ile Asp His Leu Cys Glu Leu Leu
                435                440                445
    Pro Arg Leu Gln Ala Arg Tyr Tyr Ser Ile Ala Ser Ser Ser Lys Val
    450                455                460
    His Pro Asn Ser Val His Ile Cys Ala Val Ala Val Glu Tyr Glu Ala
    465                470                475                480
    Lys Ser Gly Arg Val Asn Lys Gly Val Ala Thr Ser Trp Leu Arg Thr
                    485                490                495
    Lys Glu Pro Ala Gly Glu Asn Gly Arg Arg Ala Leu Val Pro Met Phe
                500                505                510
    Val Arg Lys Ser Gln Phe Arg Leu Pro Phe Lys Pro Thr Thr Pro Val
                515                520                525
    Ile Met Val Gly Pro Gly Thr Gly Val Ala Pro Phe Met Gly Phe Ile
                530                535                540
    Gln Glu Arg Ala Trp Leu Arg Glu Gln Gly Lys Glu Val Gly Glu Thr
    545                550                555                560
    Leu Leu Tyr Tyr Gly Cys Arg Arg Ser Asp Glu Asp Tyr Leu Tyr Arg
                    565                570                575
    Glu Glu Leu Ala Arg Phe His Lys Asp Gly Ala Leu Thr Gln Leu Asn
                    580                585                590
    Val Ala Phe Ser Arg Glu Gln Ala His Lys Val Tyr Val Gln His Leu
                    595                600                605
    Leu Lys Arg Asp Lys Glu His Leu Trp Lys Leu Ile His Glu Gly Gly
                    610                615                620
    Ala His Ile Tyr Val Cys Gly Asp Ala Arg Asn Met Ala Lys Asp Val
    625                630                635                640
    Gln Asn Thr Phe Tyr Asp Ile Val Ala Glu Phe Gly Pro Met Glu His
                    645                650                655
    Thr Gln Ala Val Asp Tyr Val Lys Lys Leu Met Thr Lys Gly Arg Tyr
                    660                665                670
    Ser Leu Asp Val Trp Ser
                    675
```

<210> 56
<211> 678
<212> PRT
<213> Pig NADPH-CYTOCHROME P450 REDUCTASE P04175

<400> 56

```
    Met Gly Asp Ser Asn Val Asp Thr Gly Thr Thr Thr Ser Glu Met Val
    1                5                10                15
    Ala Glu Glu Val Ser Leu Phe Ser Ala Thr Asp Met Val Leu Phe Ser
                    20                25                30
    Leu Ile Val Gly Leu Leu Thr Tyr Trp Phe Ile Phe Arg Lys Lys Lys
                    35                40                45
    Asp Glu Val Pro Glu Phe Ser Lys Ile Glu Thr Thr Thr Ser Ser Val
                    50                55                60
    Lys Asp Ser Ser Phe Val Glu Lys Met Lys Lys Thr Gly Arg Asn Ile
    65                70                75                80
    Ile Val Phe Tyr Gly Ser Gln Thr Gly Thr Ala Glu Glu Phe Ala Asn
```

```
                    85                   90                   95
        Arg Leu Ser Lys Asp Ala His Arg Tyr Gly Met Arg Gly Met Ala Ala
                       100                 105                 110
        Asp Pro Glu Glu Tyr Asp Leu Ser Asp Leu Ser Ser Leu Pro Glu Ile
  5            115                 120                 125
        Glu Asn Ala Leu Ala Val Phe Cys Met Ala Thr Tyr Gly Glu Gly Asp
               130                 135                 140
        Pro Thr Asp Asn Ala Gln Asp Phe Tyr Asp Trp Leu Gln Glu Ala Asp
        145                 150                 155                 160
  10    Val Asp Leu Thr Gly Val Lys Tyr Ala Val Phe Gly Leu Gly Asn Lys
                       165                 170                 175
        Thr Tyr Glu His Phe Asn Ala Met Gly Lys Tyr Val Asp Lys Arg Leu
                       180                 185                 190
        Glu Gln Leu Gly Ala Gln Arg Ile Phe Asp Leu Gly Leu Gly Asp Asp
  15           195                 200                 205
        Asp Gly Asn Leu Glu Glu Asp Phe Ile Thr Trp Arg Glu Gln Phe Trp
               210                 215                 220
        Pro Ala Val Cys Glu His Phe Gly Val Glu Ala Thr Gly Glu Glu Ser
        225                 230                 235                 240
  20    Ser Ile Arg Gln Tyr Glu Leu Val Val His Thr Asp Met Asp Thr Ala
                       245                 250                 255
        Val Val Tyr Thr Gly Glu Met Gly Arg Leu Lys Ser Tyr Glu Asn Gln
                       260                 265                 270
        Lys Pro Pro Phe Asp Ala Lys Asn Pro Phe Leu Ala Val Val Thr Thr
  25           275                 280                 285
        Asn Arg Lys Leu Asn Gln Gly Thr Glu Arg His Leu Met His Leu Glu
               290                 295                 300
        Leu Asp Ile Ser Asp Ser Lys Ile Arg Tyr Glu Ser Gly Asp His Val
        305                 310                 315                 320
  30    Ala Val Tyr Pro Ala Asn Asp Ser Ala Leu Val Asn Gln Leu Gly Glu
                       325                 330                 335
        Ile Leu Gly Thr Asp Leu Asp Ile Val Met Ser Leu Asn Asn Leu Asp
                       340                 345                 350
        Glu Glu Ser Asn Lys Arg His Pro Phe Pro Cys Pro Thr Thr Tyr Arg
  35           355                 360                 365
        Thr Ala Leu Thr Tyr Tyr Leu Asp Ile Thr Asn Pro Pro Arg Thr Asn
               370                 375                 380
        Val Leu Tyr Glu Leu Ala Gln Tyr Ala Ser Glu Pro Ser Glu Gln Glu
        385                 390                 395                 400
  40    Gln Leu Arg Lys Met Ala Ser Ser Ser Gly Glu Gly Lys Glu Leu Tyr
                       405                 410                 415
        Leu Ser Trp Val Val Glu Ala Arg Arg His Ile Leu Ala Ile Leu Gln
                       420                 425                 430
        Asp Tyr Pro Ser Leu Arg Pro Pro Ile Asp His Leu Cys Glu Arg Leu
  45           435                 440                 445
        Pro Arg Leu Gln Ala Arg Tyr Tyr Ser Ile Ala Ser Ser Ser Lys Val
               450                 455                 460
        His Pro Asn Ser Val His Ile Cys Ala Val Val Val Glu Tyr Glu Thr
        465                 470                 475                 480
  50    Lys Ser Gly Arg Val Asn Lys Gly Val Ala Thr Ser Trp Leu Arg Ala
                       485                 490                 495
        Lys Glu Pro Ala Gly Glu Asn Gly Arg Arg Ala Leu Val Pro Met Phe
               500                 505                 510
        Val Arg Lys Ser Gln Phe Arg Leu Pro Phe Lys Ala Thr Thr Pro Val
  55           515                 520                 525
        Ile Met Val Gly Pro Gly Thr Gly Val Ala Pro Phe Ile Gly Phe Ile
               530                 535                 540
```

```
Gln Glu Arg Ala Trp Leu Gln Glu Gln Gly Lys Glu Val Gly Glu Thr
545                 550                 555                 560
Leu Leu Tyr Tyr Gly Cys Arg Arg Ser Asp Glu Asp Tyr Leu Tyr Arg
                565                 570                 575
Glu Glu Leu Ala Gln Phe His Ala Lys Gly Ala Leu Thr Arg Leu Ser
            580                 585                 590
Val Ala Phe Ser Arg Glu Gln Pro Gln Lys Val Tyr Val Gln His Leu
        595                 600                 605
Leu Lys Arg Asp Lys Glu His Leu Trp Lys Leu Ile His Asp Gly Gly
    610                 615                 620
Ala His Ile Tyr Ile Cys Gly Asp Ala Arg Asn Met Ala Arg Asp Val
625                 630                 635                 640
Gln Asn Thr Phe Cys Asp Ile Val Ala Glu Gln Gly Pro Met Glu His
                645                 650                 655
Ala Gln Ala Val Asp Tyr Val Lys Lys Leu Met Thr Lys Gly Arg Tyr
                660                 665                 670
Ser Leu Asp Val Trp Ser
            675
```

```
<210> 57
<211> 19
<212> DNA
<213> Bacteriophage SP6 primer

<400> 57
gatttaggtg acactatag                                              19

<210> 58
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic adapter with NotI site and poly dT tail

<221> misc_structure
<222> (1)...(1)
<223> The first base is phosphorylated

<400> 58
gactagttct agatcgcgag cggccgccct tttttttttt tttt                  44

<210> 59
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Top Strand of a SalI adapter

<400> 59
tcgacccacg cgtccg                                                 16

<210> 60
<211> 12
<212> DNA
<213> Artificial Sequence
```

<220>
<223> Bottom Strand of a SalI adapter, the first base is
      phosphorylated

<221> misc_feature
<222> (1)...(1)
<223> The first base is phosphorylated

<400> 60
gcctgcgcac cc   12

<210> 61
<211> 21
<212> DNA
<213> human oxidoreductase primer 1C

<400> 61
gtggaccaca agctcgtact g   21

<210> 62
<211> 22
<212> DNA
<213> human oxidoreductase primer 2C

<400> 62
catcgaccac ctgtgtgagc tg   22

<210> 63
<211> 22
<212> DNA
<213> human oxidoreductase primer 2D

<400> 63
gtacaggtag tcctcatccg ag   22

<210> 64
<211> 3710
<212> DNA
<213> Aspergillus niger NADP CYP450 oxidoreductaseZ26838

<400> 64
cctgtatcct gataactcct cagcaaatcg gagtaaacag aaggacaagt cattggagta   60
ctaagtagct ccgtgtcaga gacccggaca ggatcagctt ctccgaaccc gagactccgg   120
gcgaaaaggc caccatcgct caggctacca cctgtgttcc ttccgtcgat cgtcctccct   180
cgtttccggc tcacggcccc ccaaattatt gcggtctgct tagcagtggg ttcggcctct   240
ctgttcttcc tggatcacac cacggcttac tttcttatcc ttttcctttt cctttcttcc   300
tttcttcctg ttctcctttc ttcctttcca cccccttctt tcttttaacc ccatagcgtc   360
attctttctt ccgtttttatc tttggttttg ggacgccgcc accttatctc ggttcctgcc   420
tcggtctccg gtgatcgcac ctggataggc taagcgtagg gaggtgtgac attcttcttt   480
cacctcctct ccttttcccg cctcactccg ttcaatcccc cgctccaccc tttcagactc   540
gccatcgtat caagtcgggg cctttgcttg cgccgctgaa cagcctcacc atggcgcaac   600
tcgataccct cgatctggtg gtcctggcgg tgcttttggt gggtagcgtg gcctacttca   660
ccaagggcac ctactgggca gttgcaaaga cccgtatgcc tctaccggcc ccgcggatga   720
acggcgccgc taaggctggc aagactcgga acatcattga gaagatggaa gaaacgggca   780
agaattgtgt tattttctac ggatcgcaaa ctggaaccgc tgaggactac gcctccagat   840
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  5             50                  55                  60
        Asn Cys Val Ile Phe Tyr Gly Ser Gln Thr Gly Thr Ala Glu Asp Tyr
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        Ala Ser Arg Leu Ala Lys Glu Gly Ser Gln Arg Phe Gly Leu Lys Thr
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        Leu Lys Tyr Val Ala Phe Gly Leu Gly Asn Asn Thr Tyr Glu His Tyr
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        Glu Glu Asp Phe Leu Ala Trp Lys Glu Pro Met Trp Ala Ala Leu Ser
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        Glu Ser Met Asp Leu Glu Glu Arg Glu Ala Val Tyr Glu Pro Val Phe
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        Cys Val Thr Glu Asn Glu Ser Leu Ser Pro Glu Asp Glu Thr Val Tyr
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        Leu Phe Thr Val Lys Asp Arg Asn Cys Leu His Met Glu Ile Ser Ile
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Arg His Ser Asn Phe Lys Leu Pro Ser Asp Pro Ser Arg Pro Ile Ile
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Glu Trp Lys Thr Tyr Gln Asp Gln Leu Gly Asp Asn Leu Lys Ile Ile
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Thr Ala Phe Ser Arg Glu Gly Pro Gln Lys Val Tyr Val Gln His Arg
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Leu Arg Glu His Ser Glu Leu Val Ser Asp Leu Leu Lys Gln Lys Ala
625   630   635   640

Thr Phe Tyr Val Cys Gly Asp Ala Ala Asn Met Ala Arg Glu Val Asn
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Leu Val Leu Gly Gln Ile Ile Ala Ala Gln Arg Gly Leu Pro Ala Glu
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Lys Gly Glu Glu Met Val Lys His Met Arg Arg Arg Gly Arg Tyr Gln
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Glu Asp Val Trp Ser
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